Vol. 1103 Number 3

OFFICIAL GAZETTE

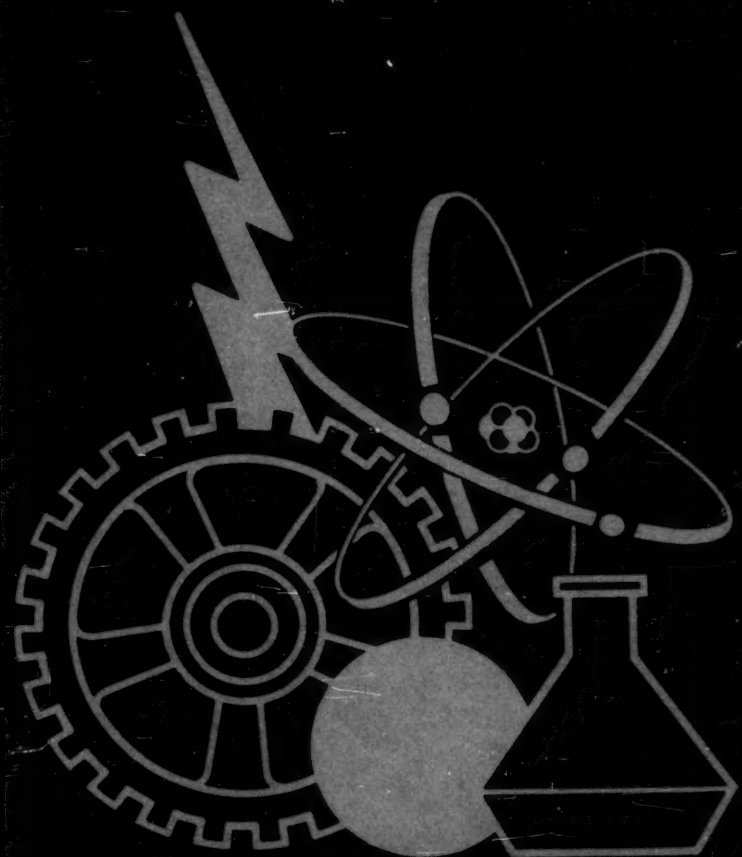
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

June 20, 1989



U.S.
DEPARTMENT
OF COMMERCE

Patent
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Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
June 20, 1989 Volume 1103 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the Official Gazette at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 80 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on June 17, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,594,734 through 4,596,052
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 15, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,334,325 through 4,335,470
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a

design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$ 245.00
By other than a small entity.....$ 490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a main tenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 2 ,1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,507,802	06/491077	04/02/85
4,507,804	06/555598	04/02/85
4,507,805	06/562034	04/02/85
4,507,813	06/525441	04/02/85
4,507,814	06/504898	04/02/85
4,507,818	06/402508	04/02/85
4,507,820	06/511523	04/02/85
4,507,830	06/506329	04/02/85
4,507,840	06/486524	04/02/85
4,507,864	06/403294	04/02/85
4,507,874	06/512355	04/02/85
4,507,879	06/467289	04/02/85
4,507,881	06/514934	04/02/85
4,507,884	06/576933	04/02/85
4,507,886	06/586854	04/02/85
4,507,888	06/493970	04/02/85
4,507,893	06/375000	04/02/85
4,507,896	06/445689	04/02/85
4,507,910	06/553840	04/02/85
4,507,911	06/417610	04/02/85
4,507,915	06/573542	04/02/85
4,507,919	06/379068	04/02/85
4,507,925	06/261650	04/02/85
4,507,931	06/625993	04/02/85
4,507,937	06/512664	04/02/85
4,507,947	06/518137	04/02/85
4,507,952	06/418058	04/02/85
4,507,965	06/422749	04/02/85
4,507,967	06/467136	04/02/85
4,507,968	06/481816	04/02/85
4,507,982	06/348115	04/02/85
4,507,983	06/462165	04/02/85
4,507,986	06/351266	04/02/85
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4,508,004	06/574430	04/02/85
4,508,008	06/375256	04/02/85
4,508,010	06/499235	04/02/85
4,508,016	06/530977	04/02/85
4,508,017	06/398237	04/02/85
4,508,019	06/362816	04/02/85
4,508,021	06/503722	04/02/85
4,508,022	06/444166	04/02/85
4,508,027	06/563081	04/02/85
4,508,038	06/506507	04/02/85
4,508,046	06/578170	04/02/85
4,508,051	06/429979	04/02/85
4,508,053	06/455828	04/02/85
4,508,054	06/550938	04/02/85
4,508,056	06/504875	04/02/85
4,508,060	06/570240	04/02/85
4,508,061	06/551938	04/02/85
4,508,080	06/531641	04/02/85
4,508,095	06/495507	04/02/85
4,508,098	06/452025	04/02/85
4,508,099	06/351018	04/02/85
4,508,115	06/479567	04/02/85
4,508,117	06/417478	04/02/85
4,508,129	06/425616	04/02/85
4,508,133	06/575633	04/02/85
4,508,134	06/618709	04/02/85
4,508,136	06/426375	04/02/85
4,508,144	06/555853	04/02/85
4,508,154	06/557328	04/02/85
4,508,164	06/533144	04/02/85
4,508,178	06/424302	04/02/85
4,508,184	06/498868	04/02/85
4,508,188	06/383104	04/02/85
4,508,192	06/479143	04/02/85
4,508,198	06/490199	04/02/85
4,508,199	06/436196	04/02/85
4,508,213	06/519034	04/02/85
4,508,215	06/485358	04/02/85
4,508,217	06/322968	04/02/85
4,508,221	06/303887	04/02/85
4,508,222	06/586338	04/02/85
4,508,224	06/306391	04/02/85

Patent Number	Serial Number	Issue Date
4,508,231	06/240515	04/02/85
4,508,233	06/479866	04/02/85
4,508,237	06/570762	04/02/85
4,508,238	06/398098	04/02/85
4,508,239	06/471052	04/02/85
4,508,248	06/402894	04/02/85
4,508,250	06/483763	04/02/85
4,508,252	06/304214	04/02/85
4,508,272	06/425503	04/02/85
4,508,274	06/551890	04/02/85
4,508,278	06/523065	04/02/85
4,508,281	06/523649	04/02/85
4,508,307	06/623249	04/02/85
4,508,308	06/374794	04/02/85
4,508,316	06/488099	04/02/85
4,508,319	06/553588	04/02/85
4,508,332	06/440290	04/02/85
4,508,333	06/426521	04/02/85
4,508,347	06/525918	04/02/85
4,508,348	06/587688	04/02/85
4,508,351	06/503543	04/02/85
4,508,353	06/452390	04/02/85
4,508,361	06/441148	04/02/85
4,508,372	06/270700	04/02/85
4,508,373	06/436580	04/02/85
4,508,378	06/473637	04/02/85
4,508,380	06/409938	04/02/85
4,508,384	06/424402	04/02/85
4,508,385	06/366451	04/02/85
4,508,391	06/435315	04/02/85
4,508,403	06/553853	04/02/85
4,508,406	06/431971	04/02/85
4,508,410	06/442335	04/02/85
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4,508,479	06/299731	04/02/85
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4,508,484	06/387844	04/02/85
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4,508,493	06/476024	04/02/85
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4,508,503	06/546107	04/02/85
4,508,509	06/464083	04/02/85
4,508,511	06/608123	04/02/85
4,508,512	06/436719	04/02/85
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4,508,518	06/336508	04/02/85
4,508,519	06/455469	04/02/85
4,508,545	06/549139	04/02/85
4,508,557	06/510865	04/06/85
4,508,560	06/439456	04/02/85
4,508,562	06/498990	04/02/85
4,508,580	06/555708	04/02/85
4,508,604	06/476522	04/02/85
4,508,621	06/536451	04/02/85
4,508,639	06/497234	04/02/85
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4,508,645	06/500773	04/02/85
4,506,647	06/608736	04/02/85
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4,508,663	06/514403	04/02/85
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4,508,671	06/525498	04/02/85
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4,508,717	06/522359	04/02/85
4,508,723	06/385139	04/02/85
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4,508,748	06/579550	04/02/85
4,508,787	06/217482	04/02/85
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4,508,809	06/497087	04/02/85
4,508,820	06/582862	04/02/85
4,508,903	06/488090	04/02/85
4,508,906	06/581859	04/02/85
4,508,914	06/375060	04/02/85
4,508,917	06/479937	04/02/85
4,508,921	06/625761	04/02/85
4,508,929	06/455362	04/02/85
4,508,933	06/471110	04/02/85
4,508,935	06/500357	04/02/85
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4,508,942	06/555819	04/02/85
4,508,945	06/533735	04/02/85
4,508,949	06/429099	04/02/85
4,508,950	06/474745	04/02/85
4,508,951	06/409663	04/02/85
4,508,956	06/412994	04/02/85
4,508,958	06/450169	04/02/85
4,508,969	06/277348	04/02/85
4,508,972	06/572285	04/02/85
4,508,973	06/613808	04/02/85
4,508,990	06/419176	04/02/85
4,508,994	06/480346	04/02/85
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4,509,000	06/480800	04/02/85
4,509,004	06/395331	04/02/85
4,509,010	06/452885	04/02/85
4,509,012	06/454690	04/02/85
4,509,051	06/420209	04/02/85
4,509,054	06/446735	04/02/85
4,509,074	06/463485	04/02/85
4,509,085	06/405744	04/02/85
4,509,102	06/473256	04/02/85
4,509,105	06/586307	04/02/85
4,509,107	06/546011	04/02/85
4,509,135	06/429379	04/02/85
4,509,139	06/341230	04/02/85
4,509,152	06/406001	04/02/85
4,509,155	06/383258	04/02/85
4,509,160	06/558320	04/02/85
4,509,161	06/378570	04/02/85
4,509,163	06/506616	04/02/85
4,509,178	06/487119	04/02/85
4,509,179	06/536313	04/02/85
4,509,180	06/439328	04/02/85
4,509,185	06/512136	04/02/85
4,509,192	06/482848	04/02/85
4,509,202	06/500979	04/02/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,263,551, Re. S. N. 314,303, Filed Feb. 23, 1989, Cl. 324, METHOD AND APPARATUS FOR IDENTIFIYING A CONDUCTIVE OBJECT BY MONITORING THE IMPEDANCE CHANGE IN A COIL SYSTEM CASED BY INTRODUCING THE OBJECT INTO THE COIL SYSTEM, William D. Gregory, et al., Owner of Record: *The Presiedent and Directors of Georgetown University, Washington, D. C.*, Attorney or Agent: Robert C. Miller, Ex. Gp.: 267

4,354,425, Re. S. N. 326,394, Filed Mar. 20, 1989, Cl. 092, FIRE-SAFE VALVE ACTUATOR, Billy R. Bruton, et al., Owner of Record: *Axelson, Inc., Longview, Tx.*, Attorney or Agent: Jonathan E. Jobe, Jr., Ex. Gp.: 341

4,416,145, Re. S. N. 347,584, Filed May 9, 1989, Cl. 73/40.5A, UNTRASONIC LEAK DETECTING METHOD AND APPARATUS, Mork Goodman, et al., Owner of Record: *UE System, Inc., New York, N. Y.*, Attorney or Agent: Ira Lee Zebrak, Ex. Gp.: 265

4,557,877, Re. S. N. 325,099, Filed Mar. 16, 1989, Cl. 261, LIQUID DISTRIBUTION FOR AN EXCHANGE COLUMN, Josef Hofstetter, et al., Owner of Record: *Sulzer Brothers, Ltd., Winterthur, Switzerland*, Attorney or Agent: Francis C. Hard Ex. Gp.: 135

4,664,266, Re. S. N. 350,714 Filed May 11,1989, Cl. 211/87, STORAGE HAMMOCK, Kirk A. Fausett, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Harvey B. Jacobson Jr., Ex. Gp.: 355

4,685,309, Re. S. N. 241,323, Filed Sept. 6, 1989, Cl. 62/212, PULSE CONTROLLED EXPANSION VALVE FOR MULTIPLE EVAPORATORS AND METHOD OF CONTROLLING SAME, Joseph L. Behr, Owner of Record: *Emerson Electric Co., Saint Louis , Mo.*, Attorney or Agent: William B. Cunningham Jr., Ex. Gp.: 344

4,685,495, Re. S. N. 351,596, Filed May 15, 1989, Cl. 144/3K, PORTABLE WOOD PROCESSING MACHINE, Floyd Freeman, Owner of Record: *Inventor*, Attorney or Agent: John V. Moriarity, Ex. Gp.: 321

4,700,806, Re. S. N. 350,136, Filed May 10, 1989, Cl. 181/283, STAMP FORMED MUFFLER, Jon Harwood, Owner of Record: *AP Parts Manufacturing Co., New York, N. Y.*, Attorney or Agent: Gerald E. Hespos, Ex. Gp.: 211

4,725,325, Re. S. N. 351,656, Filed May 15, 1989, Cl. 156/254, METHOD OF PRODUCING LAMINATED PLATE, Hidenori Hasegawa, Owner of Record: *Meinan Machinery Works, Inc., Aichi, Japan*, Attorney or Agent: William C. Geary III, Ex. Gp.: 131

4,765,712, Re. S. N. 347,113, Filed May 2, 1989, Cl. 350/96.23, OPTICAL FIBER CABLE, William D. Bohannon, Jr., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N. J.*, Attorney or Agent: E. W. Somers, Ex. Gp.; 251

4,769,894, Re. S. N. 349,525, Filed May 9, 1989, Cl. 29/437, IRONING BOARD, Danny Simpson, Owner of Record: *Lear Siegler Seymour Corp., Seymour, Ind.*, Attorney or Agent: Kenneth I. Kohn, Ex. Gp.: 326

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,756,328, Reexam. No. 90/001,771, Requested May 15, 1989, Cl. 173/9, PNEMATICALLY OPERATED IMPACT-ACTION SELF-PROPELLED MECHANISM, Boris V. Sudnishnikov, et al., Owner of Record: *Institut Gornogo Dela Sibirskogo, Odessa, U. S. S. R.* Attorney or Agent: John C. Holman, Ex. Gp.: 320, Requester: Barry L. Grossman, Washington, D. C.

3,993,429, Reexam. No. 90/001,770, Requested May 11, 1989, Cl. 431/5, GAS CONDITIONING MEANS, William E. Archer, Owner of Record: *Wahlco International, Inc., Samta Ana, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 340, Requester: Martin P. Hoffman, Arlinton, Va.

4,568,420, Reexam. No. 90/001,772, Requested May 15, 1989, Cl. 162/65, MULTI-STAGE BLEACHING PROCESS INCLUDING AN ENHANCED OXIDATIVE EXTRACTION STAGE, Arthur J. Nonni, Owner of Record: *International Paper Co., New York, N. Y.*, Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: Pennie & Edmonds, New York, N. Y.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Frank J. B. Bagley, Hollywood, Calif., Reg. No. 1,365,968, for the mark "MISS AMERICA PRINCESS PAGEANTS and design", Canc. No. 17,809.

ERMA S. BROWN
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Trademark Trial and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Softalk Publishing, Inc., North Hollywood, Calif., Reg. No. 1,350,574, for the mark "SOFTALK" and design, Canc. No. 17,098.

ERMA S. BROWN
Administrator,
Trademark Trail and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

Erratum

"All reference to Patent No. 4,825,749 to Joachim Neumann of Germany for `CIRCUIT ARRANGEMENT FOR POSITION AND FEE CONTROL OF A HYDRAULIC CYLINDER' appearing in the *Official Gazette* of May 2, 1989 should be deleted since no patent was granted."

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111 Metallurgical Methods and Apparatus, Alloys and Metal Stock
L. Dewayne Rutledge rm 10E02 CP3..... 557-6722

112 Electro-Chemistry, Process and Apparatus
John F. Niebling rm 10B04 CP3..... 557-8788

113 Inorganic compounds and non-metallic elements (except radioactive); chemical gas purification processes; beneficiating ores; hydrometallurgy; magnetic and piezoelectric compositions plaster; single crystals and crystallization
John Doll rm 9A15 CP3..... 557-2517

114 Methods for semiconductor treating and manufacturing; batteries; photovoltaic cells and their methods of operation
Brian E. Hearn rm 10D35 CP3..... 557-6728

115 Chemical compositions, dying and pigments
Paul Lieberman rm 10A15 CP3..... 557-8779

116 Mineral oil processes and products, catalytic compositions, chemistry of hydrocarbons, fuel and igniting devices, sugar, starch and carbohydrates, cleaning and contact with solids and carbon compounds
Helen Sneed rm 9D35 CP3..... 557-3029

118 Liquid and solid fuels, chemical and biological fertilizers, refractory glass and cement compositions, lubricating compositions
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121 Heterocyclic organic chemistry, nitriles and azo chemistry
Mary C. Lee rm 8A19 CP2..... 557-1750

122 Nitrogen containing heterocyclic compounds, mercaptans and phosphorous esters
Mukund Shah rm 8B32 CP2..... 557-3978

125 Medicines, poisons, cosmetics and testing compositions
Douglas Robinson rm 8B02 CP2..... 557-0440

126 Organic carboxylic acid and ester compounds, oxy, aldehyde and keto compounds, phosphorous acid compounds
Donald Moyer rm 7D01 CP2..... 557-3920

129 Herbicides, heterocyclic and nitrogen chemistry
Glennon H. Hollrah rm 8D31 CP2..... 557-3920

130 Specialized Chemical Industries and Chemical Engineering
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SAC Ruth Lyles rm 8C17 CP3..... 557-2475
131 Adhesive bonding and miscellaneous chemical manufacture
Michael W. Ball rm 9E02 CP3..... 557-2475
132 Food or edible material, processes, compositions and products
Donald E. Czaja rm 8D01 CP3..... 557-2475
133 Paper making and fiber liberation; glass manufacture; concentrating evaporators, separatory and thermolytic distillation processes and apparatus; separating and assorting solids-froth floatation; and compositions, method and apparatus for etching in chemical manufacture gas, heating and illumination apparatus and process and mineral oils apparatus
David L. Lacey rm 8B36 CP3..... 557-2475
135 General molding or treating apparatus; static molds; gas separation; gas and liquid contact
Jay H. Woo rm 8D35 CP3..... 557-2475
136 Liquid purification or separation Richard V. Fisher rm 7A09 CP3... 557-2475
137 Processes of plastic and nonmetallic article shaping or treating
Jan H. Silbaugh rm 8A01 CP3..... 557-2475
139 Coating processes and coating apparatus
Norman Morgenstern rm 9B02 CP3..... 557-2475

150 High Polymer Chemistry, Plastics, Coating, Photography, Stock Materials and Compositions rm 11C19 CP2..... 557-6525
Director James O. Thomas, Jr. rm 11A04 CP2..... 557-6533
Secretary Sharon C. Graham rm 11A04 CP2..... 557-6533
General Information/Receptionist rm 11C19 CP2..... 557-6525
SAC Ellen Scott rm 11C19 CP2..... 557-6525
151 Mixed synthetic resin compositions, block and graft copolymers and irradiation of polymers
John Bleutge rm 11C19 CP2..... 557-6525
153 Foams, condensation polymers of cellulose, phenols, isocyanates, polyesters, polyepoxides, stabilization of polymers
John Kight, III rm 11C19 CP2..... 557-6525
154 Stock materials or miscellaneous articles of manufacture
George Lesmes rm 11C19 CP2..... 557-6525
155 Polymer compositions, addition polymers, and carbohydrates
Joseph Schofer rm 11C19 CP2..... 557-6525
156 Radiation imagery chemistry - process, composition or product, and stock materials or miscellaneous articles of manufacture
Paul Michl rm 11C19 CP2..... 557-6525
158 Coating apparatus, record receivers, stock materials or miscellaneous articles, and selected imaging processes and products
Ellis Robinson rm 11C19 CP2..... 557-6525

180 Biotechnology rm 9C13 CP2..... 557-0664
Director John E. Kittle rm 9A09 CP2..... 557-3637
Secretary Betty Kaminsky rm 9A09 CP2..... 557-3637
General Information/Receptionist rm 9C13 CP2..... 557-0664
SAC Kathryn Perry rm 9C13 CP2..... 557-0664

181 Chemical apparatus such as analyzers, reactors and sterilizers; processes of chemical and clinical analysis, sterilizing and preserving; immunology and liquid purifications or separation by living organisms
Barry S. Richman rm 9B02 CP3..... 557-6629

182 Clinical chemistry, microbiology, immunology and enzymology, purification and chemical engineering
Robert J. Warden rm 9B32 CP2..... 557-7369

183 Carbohydrate chemistry, drug, bioaffecting and body treating compositions containing carbohydrates, animal or plant extracts of undetermined constitution and chemical engineering
Johnnie R. Brown rm 8D31 CP2..... 557-3776

184 Multicellular organisms (animal/plant), molecular genetics, cell culture, immunology, hybridoma, molecular biology, microbiology, fermentation metabolism and chemical engineering
Charles F. Warren rm 10D32 CP2..... 557-7387

185 Molecular genetics, catalysis, enzymology, microbiology and chemical engineering
Thomas G. Wiseman rm 9D31 CP2..... 557-3567

186 Peptide and protein chemistry, drug, bio-affecting and body treating compositions containing peptides, lymphokines other than interferons, antibodies or antigens
Margaret Moskowitz rm 9B08 CP2..... 557-0664

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210 Industrial Electronics, Physics and Related Elements rm 9C17 CP4.. 557-7405
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L. Thomas Hix rm 9B40 CP4..... 557-7674

212 Electrical Motor-generator Structure, Piezoelectric Elements and Devices, Generator Systems, Battery and Condenser Charging and Discharging, Power Supply Regulation, and Conversion Systems
Patrick R. Salce rm 9A01 CP4..... 557-9695

214 Electrical Switches and Arc Suppression, Heating by Induction, Plasma and Electric Discharge Machining, Industrial Electric Heating Furnaces, Electrical Component Housing and Mounting and Protection of Electrical Systems and Devices
A. David Pellinen rm 8B34 CP4..... 557-7215

215 Conductors, insulators, inductors, electric photocopying, electrical devices and electronic music
Arthur T. Grimley rm 9E16 CP4..... 557-7671

216 Recorders, Scales, Magnets, Magnetic and Thermal Switches, Electric Heating, Electric Welding and Resistors
Elliot A. Goldberg rm 8B02 CP4..... 557-2323

217 Motor Control, Electrical Transmission Systems, Prime-mover Dynamo Plants, Electrical Elevator Controls, Code Conversion and Horology
William M. Shoop Jr rm 9D01 CP4..... 557-3231

220/290 Utility and Design Applications rm 10C17 CP4..... 557-2895
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SAC Joanne Hodge rm 10C17 CP4..... 557-9151
Licensing and Review Hilda Grimes rm 10C34 CP4..... 557-4948
Mildred Scott rm 10C34 CP4..... 557-4949
221 Weapons (firearms, ordnance, ammunition, explosive devices), general lubrication, nuclear reactor systems, illumination, aeronautics and ships as well as all classified mechanical applications
Deborah L. Kyle rm 10D01 CP4..... 557-3253
222 Radio, optic, acoustic, wave communications systems and all classified electrical applications
Thomas H. Tarcza rm 10E16 CP4..... 557-4922
223 Chemical and including radioactive materials, powder metallurgy, rocket fuels, explosives and thermal and photoelectric batteries as well as all classified chemical applications
John Terapane rm 10E02 CP4..... 557-4934
291 Ornamental designs in the area of industrial arts
Wallace R. Burke rm 11E02 CP6..... 557-4979
292 Ornamental designs for fine arts Bernard Ansher rm 11A02 CP6..... 557-4965

230 Information Processing, Storage and Retrieval rm 11C17 CP4..... 557-2878
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231 General & Special Purpose Digital Data Processing, Digital Arithmetic, Speech Analysis & Synthesis & Data Presentation Systems
Gary V. Harkcom rm 10B02 CP4..... 557-7128
232 General & Special Purpose Digital Data Processing Systems
Archie E. Williams rm 11B02 CP4..... 557-2119
233 Static Information Storage & Retrieval & Elements of Dynamic Magnetic Information Storage & Retrieval Systems
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234 Ordnance or Weapon System Computers & Special Applications of Computers Including Vehicle Control, Navigation, Measuring, Testing & Monitoring
Parshotam S. Lall rm 11D17 CP4..... 557-4316
235 Electrical Dynamic Information Storage & Retrieval & Record Controlled Systems
Alan Faber rm 11D25 CP4..... 557-2065
236 Computer Control Systems, Miscellaneous Applications of Computers, Computer Aided Product Manufacturing, Artificial Intelligence, Analog & Hybrid Computers & Error Correction & Detection Systems
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237 General & Special Purpose Digital Data Processing Systems
Gareth D. Shaw rm 11B40 CP4..... 557-8047

240 Packages, Cleaning, Textiles and Geometrical Instruments
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SAC Doretha A. Bailey rm 6D15 CP4..... 557-2900
241 Packaging art including glass, fabric, metal, wood, paper and plastic receptacles plus closures
Stephen Marcus rm 6B02 CP4..... 557-4719
242 Fluid treating, presses, food apparatus, cleaning, agitating, centrifuges, and web feeding
Harvey C. Hornsby rm 6E02 CP4..... 557-6116
243 Conduits, bathroom facilities, cleaning apparatus, filling apparatus, switches, and article carriers
Henry Recla rm 6E10 CP4..... 557-9891
245 Textiles, winding and reeling, pushing and pulling, bearings, and flexible torque transmitters
Stuart S. Levy rm 5B24 CP4..... 557-6855
246 Measuring and testing, dynamic information storage or retrieval, optical image projectors and joint packing
William Cuchlinski rm 6E14 CP4..... 557-9894
247 Textile and leather manufacture, apparel, and textiles
Werner Schroeder rm 6D01 CP4..... 557-3302

250 Electronic and Optical Systems and Devices rm 8D17 CP4..... 557-4784
Director Edward Kubasiewicz rm 8D19 CP4..... 557-2084
Secretary Deborah P. Leeper rm 8D19 CP4..... 557-2084
General Information/Receptionist rm 8C17 CP4..... 557-4784
SAC JoAnn Davis rm 8C19 CP4..... 557-4799
251 Lasers, fiber optic devices and antennas
William L. Sikes rm 8E02 CP4..... 557-2733
252 Electronic modulators, demodulators, oscillators, amplifiers, tuners and wave transmission lines and networks
Eugene R. Laroche rm 7A15 CP4..... 557-4317
253 Semiconductor devices Andrew J. James rm 7B02 CP4..... 557-4835
254 Semiconductor and vacuum tube circuits and systems and electronic and electromechanical counting circuits and systems
Stanley D. Miller rm 7E02 CP4..... 557-4753
255 Optical measuring and testing systems and photocell circuits
Davis L. Willis rm 8D13 CP4..... 557-4339
256 Radiant energy systems Janice A. Howell rm 7E16 CP4..... 557-3453
257 Optical systems and elements and vision testing and correcting
Bruce Y. Arnold rm 8E16 CP4..... 557-2884
258 Semiconductor Devices and Antennas
Rolf Hille rm 7B12 CP4..... 557-4823

260 Communications, Measuring, Testing and Lamp/Discharge Group
rm 5C17 CP4..... 557-3321
Director Stephen G. Kunin rm 5D19 CP4..... 557-7075
Secretary Iyone L. Miles rm 5D19 CP4..... 557-7075
General Information/Receptionist rm 5C17 CP4..... 557-3321
SAC Vivian C. Harris rm 5D21 CP4..... 557-2067
261 Telegraphy, telephony and audio systems Jin F. Ng rm 4D01 CP4..... 557-7739
262 Television and television facsimile James J. Groody rm 4B02 CP4... 557-7309
263 Multiplex communications, digital communications and telecommunications
Robert L. Griffin rm 5E02 CP4..... 557-1139
264 Electrical communications, lamp and discharge devices and acoustic wave systems
Donald J. Yusko rm 5E16 CP4..... 557-3356
265 Measuring and testing of non-electrical phenomenon
Stewart J. Levy rm 4E02 CP4..... 557-7603
266 Selective visual display systems and image analysis
David K. Moore rm 5B02 CP4..... 557-6868
267 Measuring and testing of electrical phenomenon
Reinhard J. Eisenzopf rm 5D01 CP4..... 557-6878
268 Condition responsive communications, measuring and testing
Joseph A. Orsino rm 4B18 CP4..... 557-7956

MECHANICAL EXAMINING GROUPS

310 Handling and Transporting Media rm 5D19 CP3..... 557-3618
Director Bobby R. Gray rm 5D19 CP3..... 557-3677
Secretary Annette L. Pray rm 5D19 CP3..... 557-3677
General Information/Receptionist rm 5C17 CP3..... 557-3618
SAC Margaret Stevens rm 5D17 CP3..... 557-3618
311 Dispensing, article dispensing, coin handling, check-controlled apparatus, elevators, and sheet feeding or delivering devices
Joseph J. Rolla, Jr. rm 6D01 CP3..... 557-6491
312 Railways and railway equipment, motor vehicle wheels and bodies and article assorting and handling implements
Robert B. Reeves rm 5A01 CP3..... 557-6765
314 Brakes, fluid pressure brake systems, spring devices and spraying devices
Andres Kashnikow rm 5D01 CP3..... 557-3680
315 Aeronautics and marine arts and fluid conveying and fire extinguishers
Joseph F. Peters, Jr. rm 6A01 CP3..... 557-1471
316 Land and motor vehicles Charles Marmor rm 5E02 CP3..... 557-6738
317 Article handling and conveyors and dumping vehicles
Robert J. Spar rm 5D35 CP3..... 557-6732

320 Material Shaping, Article Manufacturing, Tools rm 6C17 CP3..... 557-3694
Director Donald G. Kelly rm 6D19 CP3..... 557-3547
Secretary Danita L. Ingram rm 6D19 CP3..... 557-3547
General Information/Receptionist rm 6C17 CP3..... 557-3694
SAC Vera Thomas rm 6C17 CP3..... 557-6498
321 Metal deforming, packaging machinery, butchering and woodworking
Robert Spruill rm 7E02 CP3..... 557-9856
322 Electrical connectors, gear cutting, milling and chucks
Gil Weidenfeld rm 6D35 CP3..... 557-3698
323 Abrading, workholders, tools and paper manufactures
Frederick Schmidt rm 7D35 CP3..... 557-6506
324 Cutting, cutlery, tools, bookmaking, and printed matter
Frank T. Yost rm 6E02 CP3..... 557-6039
325 Metal founding, metal turning, miscellaneous hardware, fishing, vermin trapping and welding
Nicholas Godici rm 7D01 CP3..... 557-6513
326 Metal working, comminution and wire working
Howard Goldberg rm 7A01 CP3..... 557-9871

330 Surgery, Plant and Animal Husbandry, Amusement and Exercise Devices and Printing rm 4C17 CP4..... 557-6225
Director John J. Love rm 4D19 CP4..... 557-3164
Secretary Norma L. Watson rm 4D19 CP4..... 557-3164
General Information/Receptionist rm 4C17 CP4..... 557-6225
SAC Clara S. Desmukes rm 4D21 CP4..... 557-6225
331 Planting, Surgical Instruments, toys, earth working
Robert Hafer rm 3A01 CP3..... 557-3125
332 Exercising and Therapy Devices, Tobacco, Artificial Body Parts, Bandages and Hand Applicators
Richard Apley rm 4E16 CP4..... 557-3125
333 Dentistry, animal husbandry, harvesting and sign exhibiting
Gene Mancene rm 3E16 CP3..... 557-3125
334 Amusement games or educational devices
Richard Pinkham rm 3E02 CP4..... 557-3125
335 Surgery diagnostics Kyle Howell rm 3E02 CP3..... 557-3125
336 Surgery instruments, medicators or receptors
C. Fred Rosenbaum rm 3B11 CP3..... 557-3125
337 Printing, typewriting or excavating Edgar Burr rm 3D01 CP3..... 557-3125

340 Solar, Heat, Power and Fluid Engineering Devices rm 3C17 CP4..... 557-3128
Director Donley J. Stocking rm 3D19 CP4..... 557-3340
Secretary Carol A. Jones rm 3D19 CP4..... 557-3340
General Information/Receptionist rm 3C17 CP4..... 557-3128
SAC Verlene Day rm 3C17 CP4..... 557-3128
341 Expansible chamber motors, fluid power systems, turbines, combustion
Robert E. Garrett rm 3B22 CP4..... 557-3464
342 Internal combustion engines including charge forming and ignition systems
Charles J. Myhre rm 2D01 CP4..... 557-5690
343 Combustion power plants, jet engines, pumps rotary expansible chamber devices, turbocharges, superchargers, rotary internal combustion engines
Carlton R. Croyle rm 3B02 CP4..... 557-0398
344 Environmental control including; heating, air conditioning, refrigeration and ventilation; lubrication
Albert J. Makay rm 3D01 CP4..... 557-0397
346 Heating the environment and extracting heat from sun, poppet valve operation and exhaust gas treatment for internal combustion engines, and powerplant of the type using natural heat
Ira S. Lazarus rm 2B02 CP4..... 557-5679
347 Fluid handling which includes valves, pressure regulators and flow controllers for liquids and gases, heat exchange, and devices and methods for transferring heat from one material to another
Martin P. Schwadron rm 2B42 CP4..... 557-6777

350 General Construction, Petroleum and Mining Engineering rm 3C17 CP3..... 557-6200
Director Al Lawrence Smith rm 3D19 CP3..... 557-3414
Secretary Carol M. Sinclair rm 3D19 CP3..... 557-3414
General Information/Receptionist rm 3C17 CP3..... 557-6200
SAC Joyce G. Hill rm 3D13 CP3..... 557-6200
351 Joints and connections, pipe couplings, fences, earth & hydraulic engineering, excavating, mechanical guns and projectors
Randolph A. Reese rm 4D01 CP3..... 557-6200
352 Gearing, power transmissions, clutches, machine elements
Leslie A. Braun rm 2B36 CP3..... 557-6200
354 Building structures and components David A. Scherbel rm 2D35 CP3.. 557-6200
355 Supports, racks, fire escapes, ladders, scaffolds, flexible partitions
Ramon S. Britts rm 4E02 CP3..... 557-6200
356 Petroleum, mining, highway and bridge engineering, well drilling, and endless belts
Jerome W. Massie rm 4D35 CP3..... 557-6200
357 Tables, chairs, cabinets, windows, doors, buckles, buttons, clasps
Kenneth J. Dorner rm 4A01 CP3..... 557-6200
358 Fasteners, safes, locks, closure fasteners, beds, control levers and linkages
Gary L. Smith rm 4D17 CP3..... 557-6200

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Public Information Specialist Oscar G. Mastin rm 208B PK1..... 557-3341
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G. Lee Skillington rm 902 PK2..... 557-3065
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Richard C. Owens rm 902 PK2..... 557-3065
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Program Analyst Blake Pearl rm 3C06 CP2..... 557-3268
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Attorney Advisor David M. Soroka rm 1205 CP6..... 557-9514
Attorney Advisor Joseph H. Webb rm 1205 CP6..... 557-9514
Secretary Lisa Y. Harrell rm 1205 CP6..... 557-9514

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Secretary Tawana A. Hawkins rm 3C06 CP2..... 557-3268
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Patricia M. Davis rm 3C06 CP2..... 557-3268
Secretary Nancy P. Miller rm 3C06 CP2..... 557-3268
Administrator for Trademark Policy and Procedures
James T. Walsh rm 3C06 CP2..... 557-3268
Secretary (Vacant) rm 3C06 CP2..... 557-3268
Petitions and Classification Attorney
Jessie N. Marshall rm 3C06 CP2..... 557-3268
Petitions Assistant Annette L. Pray rm 3C06 CP2..... 557-3268
Trademark Procedures and Special Projects Attorney
(Vacant) rm 3C06 CP2..... 557-3268
Secretary Nina Bailey rm 3C06 CP2..... 557-3268
Trademark Program Assistant (Vacant) rm 3C06 CP2..... 557-3268
Paralegal Assistant Keturah Patrick rm 3C06 CP2..... 557-3268
Paralegal Assistant Doris Kahn rm 3C06 CP2..... 557-3268
Paralegal Assistant Roseanne Green rm 3C06 CP2..... 557-3268
Trademark Law Offices
Managing Attorney Law Office I Deborah Cohn rm 3C28 CP2..... 557-3273
Senior Attorney Teresa Rupp
Support Staff Manager Carolyn Spriggs
Managing Attorney Law Office II Ron Williams rm 2C24 CP2..... 557-3277
Senior Attorney Craig Morris
Senior Attorney Sharon Marsh
Support Staff Manager Doshie Day
Managing Attorney Law Office III Myra Kurzbard rm 2C22 CP2..... 557-9560
Senior Attorney Robert Feeley
Senior Attorney Jody Drake
Support Staff Manager (Vacant)
Managing Attorney Law Office IV Thomas Lamone rm 3C13 CP2..... 557-9550
Senior Attorney John Demos
Senior Attorney Linda Skaro
Support Staff Manager Elsie Bradley
Managing Attorney Law Office V Paul Fahrenkoph rm 2C11 CP2..... 557-5380
Senior Attorney Mark Traphagen
Senior Attorney Susan Richards
Support Staff Manager Thurmond Streater
Managing Attorney Law Office VI Ronald E. Wolfington rm 3C27 CP2.. 557-2937
Senior Attorney Mary Sparrow
Senior Attorney Robert Crowe
Support Manager Pearl Clements
Managing Attorney Law Office VII Lynne Beresford rm 4C13 CP2..... 557-5237
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Senior Attorney Michelle Wiseman
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Managing Attorney Law Office VIII Sidney Moskowitz rm 4C11 CP2.... 557-5242
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Senior Attorney David Stine
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Trademark Services Division Director Doreane Poteat rm 4C25 CP2..... 557-5249
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Secretary Sophia Brock rm 4D29 CP2..... 557-5249
Quality Review Clerk Deborah Ahmed rm 4C25 CP2..... 557-5249
Application & Classification Section Leon Jackson rm 4B30 CP2..... 557-5255
Publication & Issue Supervisor (Vacant) rm 4C23 CP2..... 557-5247
Post Registration Sec. Supervisor Portia Taylor rm 4C24 CP2..... 557-1986
Affidavit Examiners rm 4C24 CP2..... 557-1988
Renewal Examiners rm 4C24 CP2..... 557-1988
Mail Reader/Messenger Lilly Mott rm 4C26 CP2..... 557-5257
Microfilm Section Della Williams rm 4D27 CP2..... 557-5255

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Gary D. Krugman rm 1008 CS5..... 557-3551
Janet E. Rice rm 1008 CS5..... 557-3551
Rany L. Simms rm 1008 CS5..... 557-3551
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Secretary Dee Dee Walker rm 908 PK2..... 557-3055
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Deputy Lorraine Jiron rm 1A03 CP2..... 557-2932
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Initial Review & Serializing Branch
Shirley Steele rm 1B03 CP2..... 557-3232
Ethel Dillard rm 1B03 CP2..... 557-3478
Correspondence Branch rm 1A03 CP2..... 557-3226
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Records and Property Management Branch Flo Stanmore rm 802C PK1. 557-0410
Space and Telecommunications Branch William Morris rm 802C PK1.. 557-7331
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Travel Arrangements rm 803 PK1..... 557-0183
Support Services Branch (Vacant) FERN..... 557-3560
Transportation Unit John Holmes FERN..... 557-1531
File Information Unit William Satterwhite rm 1D01 CP3..... 557-6944
Official Search Unit Daisy Johnson FERN..... 557-9690

Office of Public Services
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Secretary Teresa Knight rm 600F PK1..... 557-9543
Deputy Director Mary E. Turowski rm 600F PK1..... 557-9543
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Secretary (Vacant) rm 1A01 CP3..... 557-2276
Patent Search Branch Bernie Thomas rm 1A01 CP3..... 557-2219
Trademark Search Library Linda Lynch rm 2C08 CP2..... 557-3281
Assignment Search Branch Shirley Royall rm 5C22 CP2..... 557-3826
Program Control Division Mary Brown Lobby CP1..... 557-7261
Secretary Louwilda Turner Lobby CP1..... 557-7261
Public Service Center
Sharon Furbush (Acting) rm 208A PK1..... 557-HELP
Secretary Gale Randolph rm 208A PK1..... 557-HELP
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Margery Tierney (Acting) rm 7D13 CP2..... 557-7770
Secretary Seletheia Taylor rm 7D13 CP2..... 557-7770
Assignment Branch Recording Officer (Vacant) rm 7D19 CP2..... 557-3266
Secretary Avis Gans rm 7D19 CP2..... 557-3266
Certification Branch Lannie C. Anderson rm 800 PK1..... 557-1552
Secretary Wanda Meredith rm 800 PK1..... 557-1552

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Director Anne Kelly rm 7D25 CP2..... 557-3236
Clerk Typist (Vacant) rm 7D25 CP2..... 557-3236
Application Processing Division Willie Bowman, Jr. rm 7D13 CP2..... 557-3256
Secretary Bernadette Peterson rm 7D13 CP2..... 557-3256
Application Clerk Mary Frances Diggs rm 7D13 CP2..... 557-3256
Classification and Routing Branch Norma White rm 7C20 CP2..... 557-3855
Administrative Examination Unit Mose Montgomery rm 7C10 CP2..... 557-3254
Special Processing Branch Otis Quick rm 7C18 CP2..... 557-3831
Data Entry Branch Everette Oliver rm 7C24 CP2..... 557-3763
Quality Review and Assembly Branch Delora Dillard rm 7C24 CP2..... 557-3763
File Maintenance and Correspondence Branch
Jeanette Gatling rm 7C12 CP2..... 557-1561
Micrographics Division Michael R. Johnson rm 7D25 CP2..... 557-9524
Patent Application Filming Branch Calvin Pullen rm 6C22 CP2..... 557-3079
Quality Control Branch Mary Smith Main Commerce..... 377-5501
Filming Branch Al Hundy Main Commerce..... 377-4968
PCT International Division
Acting Administrator Vince Turner rm 1245 CP6..... 557-2003
Program Coordinator Mary Reed rm 1245 CP6..... 557-2003
Receiving Office Branch Terry Johnson rm 1243 CP6..... 557-2003
DO/EO/IPEA Branch Lauretta Zirk rm 1243 CP6..... 557-2003

Office of Publications
Director Stanley J. Bania rm 6C07 CP2..... 557-3794
Secretary (Vacant) rm 6C07 CP2..... 557-0698
Deputy Director Richard A. Bawcombe rm 6C07 CP2..... 557-9737
Publishing Division Sylvia F. Martin rm 6C17 CP2..... 557-3283
Deputy Manager Marthina Thompson rm 6C17 CP2..... 557-6388
Allowed Files and Assembly Branch (Vacant) rm 6C30 CP2..... 557-6395
Production Control Branch Willard D. Ireland rm 6C10 CP2..... 557-6412
Editorial Branch James Alexander rm 6C06 CP2..... 557-6393
Data Base Query Section Robin Lewis rm 6C06 CP2..... 557-6392
Patent Copy Inspection Section (Vacant) rm 6C06 CP2..... 557-6393
Drafting Branch Martin Baum rm 6C14 CP4..... 557-6404
Statistical Analysis Division Michael Stellabotte rm 6C07 CP2..... 557-1963
Data Base Inspection Branch Melvinia Gary rm 6C30A CP2..... 557-6414
Certificates of Corrections Branch Mary H. Allen rm 809 PK1..... 557-0709
Technical Development Division Edwin P. Hall (Acting)
rm 6C07 CP2..... 557-1992
Patent Maintenance Division C.H. Griffen rm 811 PK1..... 557-6945

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Director R. Jacqueline Dees rm 600A PK1..... 557-1692
Secretary (Vacant) rm 600A PK1..... 557-1692
Program Assistant Paula Reid rm 600A PK1..... 557-1692
Supervisory Equal Opportunity Specialist
Godfrey Beckett rm 600A PK1..... 557-1692
Equal Opportunity Specialists:
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Myra P. Young rm 600A PK1..... 557-1692
Helen D. Mitchell rm 600A PK1..... 557-1692

Office of Management and Organization
Director Sara E. Bjorge rm 600B PK1..... 557-5825
Secretary Valerie Richardson rm 600B PK1..... 557-5825
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Alvin Dorsey rm 600B PK1..... 557-5825
Jean E. Buckhout 600B PK1..... 557-5825
Greg P. Mullen rm 600B PK1..... 557-5825

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Director William J. Eldridge rm 806 PK1..... 557-0014
Secretary Cristina M. Moran rm 806 PK1..... 557-0014
Contract Division Page A. Etzel rm 806 PK1..... 557-0014
Small Purchases Division Jean A. McLeod rm 806 PK1..... 557-0014

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Secretary Vickie T. Bryant rm 904 PK2..... 557-1572

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Director James R. Lynch rm 805 PK1..... 557-3875
Deputy Director Miguel B. Perez rm 805 PK1..... 557-3875
Budget Assistant Marna Engram rm 805 PK1..... 557-3875

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Director Leonard L. Nahme rm 802A PK1..... 557-3051
Secretary Virginia R. Clark rm 802A PK1..... 557-3051
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Director Frances Michalkewicz rm 1101C PK2..... 557-1610
Program Assistant Jeannette Hawthorne rm 1101C PK2..... 557-1610
PROJECT XL rm 1101C PK2..... 557-1610

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Assistant to the Personnel Officer Nancy C. Swanberg rm 700 PK1..... 557-2662
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Employee and Labor Relations Division Richard Haisch rm 700 PK1..... 557-3643
EAP Counselor Betty Scheer rm 808C PK1..... 557-6327
Workforce Planning, Development and Systems Division
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Personnel Processing Branch Beverly Boykin rm 700 PK1..... 557-1208
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Boyd Alexander rm 1002 PK2..... 557-6000
Secretary Carla Bowman rm 1002 PK2..... 557-6000
Technical Coordinator Linda Budney rm 1004 PK2..... 557-9093

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Secretary Michele Helms rm 1002 PK2..... 557-6000

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Secretary Arnett Wright rm 509 CP1..... 557-5800

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Director Bob Mason rm 1001 PK2..... 557-3646
Secretary Virginia Richardson rm 1001 PK2..... 557-3646
Deputy Director William Maykrantz rm 1001 PK2..... 557-3646

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Director (Acting) Raymond Rahn rm 911 PK2..... 557-3544
Secretary (Vacant) rm 911 PK2..... 557-3544

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Director Raymond Rahn rm 911 PK2..... 557-3544
Secretary (Vacant) rm 911 PK2..... 557-3544

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Director Doug Hines rm 1002 PK2..... 557-5637
Secretary (Vacant) rm 1002 PK2..... 557-5637

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APS Program Manager Boyd Alexander rm 1002 PK2..... 557-6000
Secretary Carla Bowman rm 1002 PK2..... 557-6000
Deputy Program Manager Don LeCrone rm 1001 PK2..... 557-6000
Secretary Paulette Whiteside rm 1001 PK2..... 557-6000

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Director Gerald Findley rm 1002 PK2..... 557-6000
Secretary Audrey Jackson rm 1002 PK2..... 557-6000

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Director David Grooms (Acting) rm 914 PK2..... 557-6154
Secretary Beverly Allen rm 914 PK2..... 557-6154

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Director Jim Oberthaller rm 1025 PK2..... 557-9634
Secretary (Vacant) rm 1025 PK2..... 557-9634

Office of Systems Engineering and Data Communications
Director Stephen Jacobson rm 1004 PK2..... 557-7862
Secretary Eliza Davis rm 1004 PK2..... 557-7862

Office of System Test and Evaluation
Director Bruce A. Reynolds rm 1002 PK2..... 557-4114
Secretary Linda Bilbo rm 1002 PK2..... 557-4114

Office of Technical Review and Evaluation
Director (Vacant) PK2
Secretary (Vacant) PK2

CM1	Crystal Mall 1, 1911 Jefferson Davis Highway
CM2	Crystal Mall 2, 1921 Jefferson Davis Highway
CP1	Crystal Plaza 1, 2001 Jefferson Davis Highway
CP2	Crystal Plaza 2, 2011 Jefferson Davis Highway
CP3	Crystal Plaza 3, 2021 Jefferson Davis Highway
CP4	Crystal Plaza 4, 2201 Jefferson Davis Highway
CP6	Crystal Plaza 6, 2221 Jefferson Davis Highway
CP34	Crystal Plaza 34, 2021 Jefferson Davis Highway
CS5	Crystal Square 5, 1755 Jefferson Davis Highway
CG2	Crystal Gateway 2, 1225 Jefferson Davis Highway
PK1	Crystal Park 1, 2011 Crystal Drive
PK2	Crystal Park 2, 2121 Crystal Drive
EADS	1232 South Eads Street
FERN	1411 South Fern Street
HCHB	Herbert C. Hoover Building, 14th & Constitution Avenue, N.W.
Warehouse	7401 Fullerton Road, Springfield, VA 22153

--REMINDER--

The use of Arlington street addresses slow down the receipt of mail being delivered by the U.S. Postal Service. Instead, mail should be addressed to the PTO using the Washington, D.C. 20231 address.

PATENT NOTICES

Certificates of Correction for Week of June 20, 1989

PP 06,541	4,768,971	4,785,172	4,794,557
4,355,223	4,769,285	4,785,173	4,795,012
4,409,212	4,769,666	4,785,199	4,795,204
4,446,231	4,769,810	4,785,638	4,795,714
4,547,347	4,769,898	4,786,017	4,796,712
4,624,180	4,769,956	4,786,148	4,797,134
4,633,447	4,770,667	4,786,176	4,798,150
4,647,161	4,771,312	4,786,530	4,798,654
4,650,200	4,772,332	4,786,944	4,798,656
4,666,927	4,772,501	4,787,349	4,799,032
4,670,615	4,772,605	4,787,549	4,799,140
4,692,184	4,772,924	4,787,558	4,799,342
4,697,353	4,774,017	4,787,661	4,799,493
4,705,871	4,775,111	4,787,723	4,800,116
4,706,161	4,775,117	4,787,870	4,800,426
4,706,764	4,775,597	4,788,021	4,801,329
4,710,165	4,776,173	4,788,330	4,802,298
4,711,327	4,776,241	4,788,634	4,802,440
4,715,897	4,776,840	4,789,160	4,802,565
4,727,189	4,777,247	4,789,758	4,802,829
4,735,909	4,778,412	4,790,037	4,803,122
4,735,985	4,778,881	4,791,623	4,803,259
4,737,873	4,778,896	4,791,722	4,803,299
4,740,150	4,778,907	4,791,924	4,803,497
4,740,263	4,780,380	4,792,146	4,803,770
4,743,511	4,780,410	4,792,281	4,804,572
4,746,431	4,780,849	4,792,354	4,804,632
4,749,128	4,781,243	4,792,645	4,804,944
4,749,596	4,781,685	4,792,753	4,805,240
4,749,874	4,781,881	4,792,774	4,807,614
4,752,908	4,782,077	4,792,822	4,811,931
4,756,851	4,782,633	4,792,946	4,812,030
4,756,991	4,783,198	4,793,009	4,812,594
4,757,455	4,783,689	4,793,411	4,813,084
4,758,528	4,783,696	4,793,671	4,814,566
4,758,660	4,784,173	4,793,737	4,817,781
4,758,773	4,784,711	4,793,878	4,825,087
4,759,820	4,784,739	4,794,042	
4,765,763	4,784,922	4,794,060	
4,767,348	4,785,113	4,794,544	

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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 572-8101 Ext.2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF May 20, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-17-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-12-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during May 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

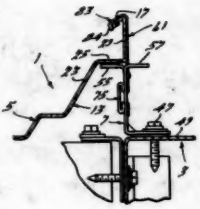
Patents ..... Numbers 3,659,294 to 3,667,068, inclusive
Plant Patents ..... 3,143 to 3,204 inclusive

REEXAMINATIONS

JUNE 20, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,193,247 (1079th)
PANEL MOUNTING CLIP
Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.
Reexamination Request No. 90/000,346, Mar. 22, 1983.
Reexamination Certificate for Patent No. 4,193,247, issued Mar. 18, 1980, Ser. No. 875,533, Feb. 6, 1978.
Int. Cl.[4] E04D *1/34*
U.S. Cl. 52—713

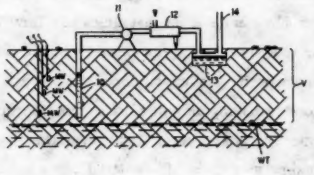


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 is confirmed.

1. A panel mounting clip assembly for interengagement with overengaged longitudinal edges of a pair of adjacent panel members and for attaching them to a panel support member, comprising a base member having a bottom flange adapted to be fastened to said support member and a web extending transversely to said bottom flange, said web having a slot therein extending substantially parallel to said bottom flange and to the length of a panel connected to the clip, a flexibie tab having a holding portion formed therein and extending through said slot, said tab having a web on one side of said base member web and said holding portion having flange means on the other side of said base member web, said flange means and tab web resiliently gripping said base member web, said tab having a width substantially less than the length of said slot and being slidable along the length of the slot, said tab having an arm projecting as cantilever above said base memoer and adapted to interfit with and be crimped to said panel edges, said base member having shelf flange means extending laterally from and substantially perpendicularly to said first mentioned web at a position spaced from said bottom flange and interengageable with coacting rim portions on the panels to support the panels at positions spaced above said support member, said holding portion substantially filling the narrower dimension of the slot and being resilient in the direction of said narrower dimension.

B1 4,593,760 (1080th)
REMOVAL OF VOLATILE CONTAMINANTS FROM THE VADOSE ZONE OF CONTAMINATED GROUND
Melvin J. Visser, Portage, Mich., and James J. Malot, Dorado, assignors to The Upjohn Company
Reexamination Request No. 90/001,521, Jun. 3, 1988.
Reexamination Certificate for Patent No. 4,593,760, issued Jun. 10, 1986, Ser. No. 567,972, Jan. 4, 1984.
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—267



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 is confirmed.

1. A process for removing a not-naturally-occurring, volatile liquid contaminant from a contaminated area of the earth, wherein the contaminated area of the earth has a subsurface water table and a subsurface vadose zone above the water table, the contaminant being present in the vadose zone, which comprises the steps of:

establishing a borehole extending downwardly from the surface of the ground within the contaminated area;

placing a first conduit within said borehole so that a ring-shaped zone is formed between the wall of said borehole and said conduit, said conduit having a perforate lower portion located in the vadose zone and spaced vertically above the water table so that fluids can flow from the vadose zone into the interior of said conduit, said perforate lower portion having an upper end and a lower end, said conduit having an imperforate upper portion above the upper end of said perforate lower portion,

filling fluid-permeable first fill material into a lower portion of said ring-shaped zone around said perforate lower portion of said conduit and which extends to the upper end of said perforate lower portion so that said first fill material will permit fluid readily to flow into said perforate lower portion of said conduit;

filling a second fill material of low fluid permeability into an upper portion of said ring-shaped zone around said imperforate upper portion of said conduit, said second fill material being effective to impede flow of air from the surface of the ground to the lower portion of the borehole;

applying a vacuum to the upper end of said conduit effective to induce flow of air and a gas containing vapor of said contaminant present in said vadose zone into the lower portion of said conduit and thence to the upper end of said conduit, the vacuum being effective to cause vaporization of a substantial quantity of said contaminant within the vadose zone around the borehole so that said contaminant is removed from the ground in vapor form, and

accumulating liquid in the lower end of said conduit and pumping said liquid to the upper end of said conduit separately from said gas.

2. A process for removing a not-naturally-occurring, volatile liquid contaminant from a contaminated area of the earth, wherein the contaminated area of the earth has a subsurface water table and a subsurface vadose zone above the water table, the contaminant being present in the vadose zone, which comprises the steps of:

establishing a borehole extending downwardly from the surface of the ground within the contaminated area;

placing a first conduit within said borehole so that a ring-shaped zone is formed between the wall of said borehole and said conduit, said conduit having a perforate lower portion located in the vadose zone and spaced vertically above the water table so that fluids can flow from the vadose zone into the interior of said conduit, said perforate lower portion having an upper end and a lower end, said conduit having an imperforate upper portion above the upper end of said perforate lower portion,

filling fluid-permeable first fill material into a lowerportion of said ring-shaped zone around said perforated lower portion of said conduit and which extends to the upper end of said perforate lower portion so that said first fill material will permit fluid readily to flow into said perforate lower portion of said conduit;

filling a second fill material of low fluid permeability into an upper portion of said ring-shaped zone around said imperforate upper portion of said conduit, said second fill material being effective to impede flow of air from the surface of the ground to the lower portion of the borehole;

applying a vacuum to the upper end of said conduit effective to induce flow of air and a gas containing vapor of said contaminant present in said vadose zone into the lower portion of said conduit and thence to the upper end of said conduit, the vacuum being effective to cause vaporization of a substantial quantity of said contaminant within the vadose zone around the borehole so that said contaminant is removed from the ground in vapor form,

forming a passageway extending downwardly from the surface of the ground to the vicinity of, but laterally spaced from, said perforate lower portion of said conduit, and

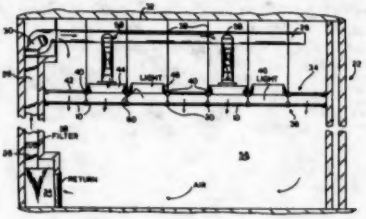
flowing air through said passageway into the vadose zone to increase lateral air flow through the vadose zone into said perforate lower portion of said conduit.

B1 4,603,618 (1981st)

AIR FILTERING AND DISTRIBUTION FOR LAMINAR FLOW CLEAN ROOM

Charles W. Soltis, P.O. Box 7328, Houston, Tex. 77248

Reexamination Request No. 90/001,504, May 4, 1988.
Reexamination Certificate for Patent No. 4,603,618, issued Aug. 5, 1986, Ser. No. 735,550, May 20, 1985.
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—31.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **14** and **15** is confirmed.

Claim **3** is cancelled.

Claims **1**, **4** and **6** are determined to be patentable as amended.

Claims **2**, **5** and **7–13**, dependent on an amended claim, are determined to be patentable.

1. An air filtering and distribution structure for use in an environmentally controlled enclosure, said structure comprising:

a first planar section spaced a predetermined distance from one surface of said enclosure *and defining a first plenum*, means for diffusing air through the first planar section such that the air is filtered thereby; and

a second planar section spaced a predetermined distance from and generally parallel to said first section *and defining therewith a second plenum at a relatively higher pressure that will cause any leakage of air through the first section to be away from the controlled enclosure*, the second planar section comprising a plurality of *translucent* membrane diffusion panels, each membrane diffusion panel comprising a frame having an open area, and a porous membrane sheet having a predetermined porosity mounted onto and extending over the frame and the open area therein with the porosity providing a predetermined resistance to flow of the air whereby during operation a slight pressure is developed between the first planar section and second planar section causing any leakage of air through the first section to be away from the controlled enclosure so that the membrane diffusion panels cooperate to provide uniform air flow through the second planar section such that the environmentally controlled enclosure achieves higher cleanliness levels for a given filtered air exchange rate than would be obtained without the membrane diffusion panels.

REISSUES

JUNE 20, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,954

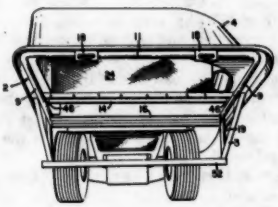
LAWN MOWER GRASS COLLECTOR BAG SUPPORT

Gary R. Lamusga, Prior Lake, Minn., assignor to The Toro Company, Minneapolis, Minn.

Original No. 4,637,202, dated Jan. 20, 1987, Ser. No. 605,329, Apr. 30, 1984. Application for reissue Jan. 21, 1988, Ser. No. 146,505

Int. Cl.[4] A01D *34/70*

U.S. Cl. 56—202 17 Claims



1. A bag support for a vertically disposed grass collector bag on a lawn mower, comprising:

(a) a support framework consisting of two sides and a front and rear end, said front end adapted for mounting to the mower;

(b) a resilient frame having four sides, three sides being continuous and co-planar, the fourth side having a central open space defined between two segments of said fourth side adjacent said space, *said two segments* being inclined at an acute angle to the plane of said three co-planar sides, said space bounded by a pair of handles extending perpendicularly outward from said segments;

(c) said bag attached to said frame, said frame defining an open end of said bag;

(d) a frame retaining bracket mounted on said front end of said framework for removably receiving a portion of said resilient frame opposite said [handle;] *handles* and

(e) a handle retaining bracket attached to said rear end of said framework for removably receiving said handles, said bracket located so that said angled segments must be biased into planar alignment with said three co-planar sides of said frame to insert said handles into said bracket, whereby said frame bracket and handle bracket cooperate with the resilience of said frame and the bias of said frame segments to retain said bag in a substantially sealed grass receiving posture against said framework.

Re. 32,955

ELECTRONIC OVERSPEED SWITCH

Lawrence E. Macy, deceased, late of Daleville, Ind. (by Amelita J. Macy, executor), assignor to Muncie Power Products, Inc., Muncie, Ind.

Original No. 4,510,899, dated Apr. 16, 1985, Ser. No. 605,842, May 1, 1984. Continuation of Ser. No. 823,514, Jan. 28, 1986, which is a continuation of Ser. No. 75,778, Sep. 17, 1979, abandoned. Application for reissue Mar. 9, 1987, Ser. No. 23,973

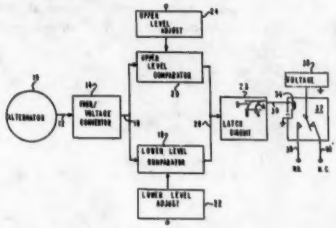
Int. Cl.[4] F22B *5/02*

U.S. Cl. 123—198 D 15 Claims

1. An electrical speed control system for selectively connecting an accessory to an engine having a rotating electric signal producing device and a rotating shaft, said speed control system comprising:

means connected to receive a signal from said signal producing device for producing a speed signal indicative of the rotational speed of said shaft;

signal level sensing means connected to receive said speed signal for determining if said speed signal is indicative of a speed below a preselected first level and if said speed signal is indicative of a speed above a preselected second level, and for producing an energization signal whenever said speed signal is below said first preselected threshold level, for interrupting said energizing signal when said speed signal is above said second level for maintaining said interruption of said energization signal until said speed signal falls below said first preselected level and for reestablishing said energizing signal when said speed signal again falls below said first preselected level; and



switch means connected to said accessory means, and a source of electrical power, said energization signal actuating said switch whenever said energization signal is present.

14. The system of claim 1 in which said engine is capable of running independently of said accessory,

said accessory being characterized in that it is unsafe to connect it to said rotating shaft when said speed signal is above said preselected first level,

said engine running continuously while the speed signal falls from above said second level to below said first level.

Re. 32,956

CARTON AND BLANK THEREFOR

Richard L. Schuster, West Monroe, La., assignor to Manville Service Corporation, Ken-Caryl, Colo.

Original No. 4,582,199, dated Apr. 15, 1986, Ser. No. 675,805, Nov. 28, 1984. Continuation-in-part of Ser. No. 557,682, Dec. 2, 1983, abandoned. Application for reissue Nov. 4, 1987, Ser. No. 117,192

Int. Cl.[4] B65D *5/54, 65/12, 75/14*

U.S. Cl. 206—428 13 Claims

1. A paperboard carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines; outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines with the outer top panel overlying and being adhesively secured to the inner top panel;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines;

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than

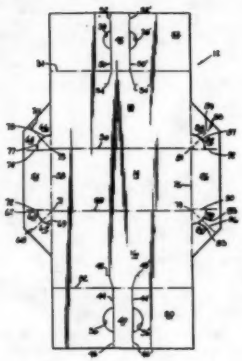
the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is [more than 45°]*less than 45°* while the angle between said tuck score line and said side score line is [less than 45°]*greater than 45°*; and

handle means on said inner and outer top panels comprising a pair of spaced substantially semicircular cutouts in each of the top panels, the pair of cutouts in the inner top panel registering with the pair of cutouts in the outer top panel and a strap on each of the top panels located intermediate the cutouts, said straps extending substantially the entire width of the respective top panel, being defined by a pair of spaced apart cut lines and registering with the other strap whereby a double thickness handle is formed with access finger cutouts.

6. A paperboard blank for a carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines;



outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines;

tuck flaps joining each partial end panel to the first and second side panels, said tuck flaps including a pair of generally triangular shaped flaps hingedly joined together along a tuck score line and joined to the side panel along side score lines and the end panel along end score lines, *said end score lines being parallel to one another and* said tuck score lines intersecting said side score lines and said end score lines such that the angle formed by the intersection of said tuck score line and said end score line is greater than 45° and the angle formed by the intersection of said tuck score line and said side score line is less than 45°; and

handle means on said inner and outer top panels comprising a pair of spaced substantially semicircular cutouts in each of the top panels adapted to register when the carton is formed and a strap on each of the top panels located intermediate the cutouts, each strap extending substantially the entire width of the respective top panels, being defined by a pair of cut lines, and adapted to register when the carton is formed.

8. A paperboard carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines; outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines with the outer top panel overlying and being adhesively secured to the inner top panel;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines, each partial end panel being held in an upright position by a pair of tuck flap means which are adhesively secured to the side panels; and

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is [more than 45°]*less than 45°* while the angle between said tuck score line and said side score line is [less than 45°]*more than 45°* ; and

tear strip means on at least one of the side panels, said tear strip means extending the entire length of the side panel, being defined by a pair of perforated lines and being located at substantially the same height as the tops of the partial end panels.

10. A paperboard blank for a carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines;

outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines, each partial end panel being hingedly joined to the first and second side panels by tuck flaps; and

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is [more than 45°]*less than 45°* while the angle between said tuck score line and said side score line is [less than 45°]*greater than 45°*; and

tear strip means on at least one of the side panels, said tear strip means extending the entire length of the side panel, being defined by a pair of perforated lines and being located a distance from the lower edge of the side panel substantially equal to the heights of the partial end panels.

13. A paperboard carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines;

outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines with the outer top panel overlaying and being adhesively secured to the inner top panel;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines; and

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines

and said end score lines such that the angle between said tuck score line and said end score line is less than 45° while the angle between said tuck score line and said side score line is more than 45°.

Re. 32,957

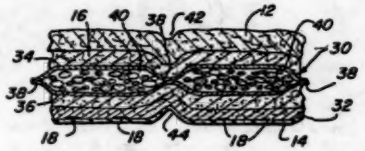
ABSORBENT ARTICLE

Robert T. Elias, deceased, late of Downers Grove, and Donald R. Elias, executor, Westmont, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Original No. 4,381,783, dated May 3, 1983, Ser. No. 274,931, Jun. 18, 1981. Continuation of Ser. No. 954,152, Oct. 24, 1978, abandoned. Application for reissue May 2, 1985, Ser. No. 729,678

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—368 **40 Claims**



23. An absorbent panel structure for an absorbent article, comprising:

an absorbent layer comprising loosely compacted cellulosic fibrous material; and

pocket means provided within said absorbent layer medially of upper and lower portions of said loosely compacted cellulosic fibrous material of said absorbent layer, said pocket means comprising discrete individual pockets of superabsorbent hydrocolloid material,

said upper and lower portions of said absorbent layer being embossed toward each other throughout the thickness of each of said upper and lower portions, at embossed areas,

said pockets of hydrocolloid material being spaced and physically separated from each other by said embossed area between adjacent ones of said pockets.

Re. 32,958

THERMOSETTING EPOXY RESIN COMPOSITIONS

Taro Koshii, Chiba; Yoshitsugu Morita; Hideo Shinmi, both of Ichihara, all of Japan, and Tsuneo Hanada, Midland, Mich., assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Original No. 4,604,435, dated Aug. 5, 1986, Ser. No. 672,052, Nov. 16, 1984. Application for reissue Sep. 14, 1987, Ser. No. 95,970

Claims priority, application Japan, Nov. 28, 1983, 58-223855

Int. Cl.[4] C08L *63/00*; C08G *59/40*; C09J *3/16*; H01B *3/40*

U.S. Cl. 525—476 **7 Claims**

1. A thermosetting epoxy resin composition comprising a mixture of

(a) 100 parts by weight of epoxy resin;

(b) 1 to 100 parts by weight of a curing agent for the he epoxy resin composition;

(c) 1 to 100 parts by weight of an organopolysiloxane compcsition which is a block copolymer containing at least one linear polysiloxane block and at least one resinous polysiloxane block wherein there is present in the block copolymer (i) 10 to 90 weight percent of linear organopolysiloxane blocks having the unit formula $—R_2SiO—_n$ and (ii) 90 to 10 weight percent of resinous organopolysiloxane blocks, the weight percents being based on the total weight of (i) and (ii) in the block copolymer, wherein R is independently selected from substituted and unsubstituted monovalent hydrocarbon groups having from 1 to 8 carbon atoms; n is an integer with a value of about 10 to [100] *1000*; the solvent solution viscosity of the block copolymer being at least 30 centipoise at 25° C. for a 40 weight percent solution [·]; the parts of (b) and (c) being based on 100 parts of (a).

Re. 32,959

AUTOMATIC FOCUSING APPARATUS

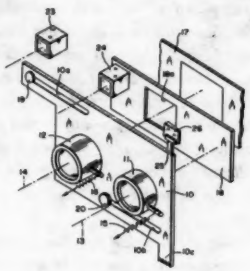
Hiroshi Ohmura; Takashi Maemori, and Toshio Ishii, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Original No. 4,582,411, dated Apr. 15, 1986, Ser. No. 736,318, May 21, 1985. Application for reissue Aug. 6, 1986, Ser. No. 893,685

Claims priority, application Japan, May 21, 1984, 59-100419

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—403 **14 Claims**



8. An automatic focusing apparatus comprising;

means for finding that in which distance range an object to be photographed stands between a close range and a far range into which object distance is divided in front and in rear of a boundary;

means for varying the focal length of said objective means in at least two steps;

means for shifting the position of said boundary in cooperation with the operation of said focal length varying means; and

means for displacing said objective means to particular positions in accordance with said distance range found.

Re. 32,960

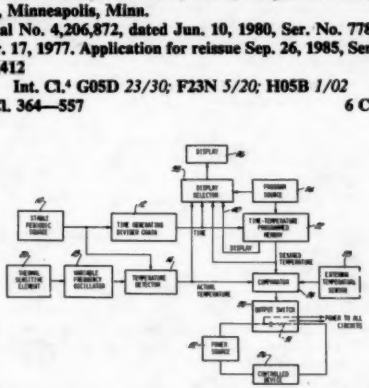
ELECTRONIC THERMOSTAT

Michael R. Levine, Ann Arbor, Mich., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 4,206,872, dated Jun. 10, 1980, Ser. No. 778,376, Mar. 17, 1977. Application for reissue Sep. 26, 1985, Ser. No. 780,412

Int. Cl.[4] G05D *23/30*; F23N *5/20*; H05B *1/02*

U.S. Cl. 364—557 **6 Claims**



18. A thermostat for controlling the application of electrical power to a specified electrically controlled temperature modifying device comprising:

a source of a periodically alternating electrical signal whose

frequency is constant at ambient temperatures over the range of the thermostat;

a source of a periodically alternating electrical signal whose frequency varies as a function of the ambient temperature on the thermostat;

circuit means, responsive to the respective frequencies of said time-base electrical signal and said temperature-sensitive electrical signal, for generating a digital electrical signal representing the ambient temperature on the thermostat;

a clock utilizing an output from said source of a constant frequency electrical signal to generate digital electrical signals having values representative of real time;

a programmable, digital memory;

means for loading said memory with a plurality of separate programs for alternative use in controlling the specified temperature modifying device, each said program comprising digital signals representing desired temperatures at particular times over a twenty-four hour period;

means for selecting one of said plurality of said programs;

circuitry for applying the output of the clock to the memory to generate a digital electric signal representative of the desired temperature at a particular time as stored in said selected program; and

means for receiving the electrical signal and the output of the memory and for generating a control signal for said specified temperature modifying device as a function of the difference between the ambient temperature and the desired temperature;

whereby, through the use of said means for selecting one of said programs the ambient temperature at the thermostat may be controlled in accordance with different days of the week.

Re. 32,961

DEVICE FOR MEASURING LOCAL RADIATION ABSORPTION IN A BODY

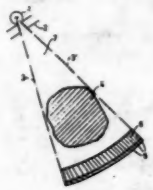
Wolfgang Wagner, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 4,057,725, dated Nov. 8, 1977, Ser. No. 610,616, Sep. 5, 1975. Application for reissue Feb. 6, 1978, Ser. No. 875,432

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1974, 2442809

Int. Cl.[4] G01N *23/00*

U.S. Cl. 378—4 **9 Claims**



4. An apparatus for examining a body by means of penetrating radiation including a source means arranged to irradate the body with a planar spread of said radiation, detector means arranged to detect the radiation to provide output signals, relating to absorption of the radiation by the body, for processing to provide a representation of the distribution of absorption in a substantially planar section of the body and means adapted to scan the planar spread of radiation in relation to the body so as to irradate said section along a plurality of beam paths passing through the body from a plurality of direction, wherein said detector means comprises a plurality of detector devices of which a predetermined number are irradiated by said spread at any time and wherein the scanning means is arranged to traverse the spread of X-rays along the detector device so as to change the irradiated device progressively.

PLANT PATENTS

GRANTED JUNE 20, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,859
ROSE PLANT NAMED 'LAVJUNE'

Keith Laver, Caledon East, Canada, assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Feb. 22, 1988, Ser. No. 159,042
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class and all parts thereof, substantially as shown and described, characterized particularly by unusual attractive bright orange yellow colored flowers of excellent exhibition form which are long lasting on the plant and as cut flowers.

6,860
ROSE PLANT NAMED POULLOW YELLOW HIT

Pernille Olesen, and Mogens N. Olesen, both of Hillerodvej 49, DK 3480 Fredensborg, Denmark

Filed Mar. 15, 1988, Ser. No. 168,431
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright yellow flowers which hold color well borne singly, one to a stem, attractively displayed against dark green foliage.

6,861
HYBRID TEA ROSE PLANT CV. AROGREWOD

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Garden Centers, Inc., Monrovia, Calif.

Filed Dec. 14, 1987, Ser. No. 132,576
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of hybrid tea rose plant cv. Arogrewod and the parts thereof, being particularly characterized by its vigorous growing plants of average height having a moderate number of strong stems; its classically shaped flowers; its flower color comprising a light lavender color on the inside surface of the petals and a creamy white on the outside petal surface; and its moderate fruity fragrance, substantially as described and illustrated herein.

6,862
ROSE PLANT NAMED 'BACARDI'

O. L. Weeks, 12610 Central Ave., Suite 76, Chino, Calif. 91710

Filed Feb. 9, 1988, Ser. No. 159,530
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—11 1 Claim

1. A new and distinct variety of rose plant of the grandiflora rose class and all parts thereof, substantially as shown and described, characterized particularly by coral pink flowers which open well and are long lasting on the plant.

6,863
ROSE PLANT NAMED 'BURWORLD'

Anthony Perry, Hemet, Calif., assignor to Co-Operative Rose Growers, Inc., Tyler, Tex.

Filed Mar. 15, 1988, Ser. No. 168,499
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by high centered, exhibition form bicolored blooms of attractive red and yellow coloring borne primarily singly to a stem.

6,864
NECTARINE TREE, "KAM RED"

Steven G. Minami, 8790 S. Buttonwillow, and Gary R. Kitahara, P.O. Box 107, both of, Reedley, Calif. 93654

Filed May 16, 1988, Ser. No. 194,229
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of nectarine tree substantially as illustrated and described which is characterized as to novelty by bearing a freestone fruit having a firm flesh and by its general resemblance to the Flamekist nectarine tree (unpatented) from which it was derived as a bud sport but from which it is distinguished therefrom by its bearing fruit which matures for harvesting approximately August 7 through August 14, this date of maturity being approximately five to six days earlier than that of the Flamekist nectarine tree and by producing fruit which have a skin which is more deeply colored than that exhibited by the fruit of the Flamekist nectarine tree.

6,865
ALSTROEMERIA NAMED STAROVER

Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaveren, B.V., Aalsmeer, Netherlands

Filed Sep. 4, 1987, Ser. No. 93,875
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. The new and distinct Alstroemeria variety and the parts thereof, substantially as herein shown and described, characterized by the large size and the light purple and yellow coloration of the flowers, which are borne singly on strong stems of an umbel formation carried by a strong, tall stem.

6,866
ALSTROEMERIA NAMED ZELPADO

Gerard J. van Zelderen, Achterweg 34-36, 1424 PR De Kwakel, Netherlands

Filed Sep. 24, 1987, Ser. No. 100,717
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. The new and distinct variety of Alstroemeria plant and parts thereof, substantially as herein shown and described, characterized by the distinctive red-purple coloration of its medium sized flowers, the upper ones of the inner petals having a white middle portion of its body, and by its continuous year around blooming habit.

6,867
CHRYSANTHEMUM PLANT NAMED APRICOT IMPALA

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,543
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Apricot Impala, as described and illustrated, and parts thereof.

6,868
CHRYSANTHEMUM PLANT NAMED PINK MONEYMAKER
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 124,548
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim
1. A new and distinct cultivar of Chrysanthemum plant named Pink Moneymaker, as described and illustrated, and parts thereof.

6,869
CHRYSANTHEMUM PLANT NAMED WALL STREET
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer, De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 124,549
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim
1. A new and distinct cultivar of Chrysanthemum plant named Wall Street, as described and illustrated, and parts thereof.

6,870
CHRYSANTHEMUM PLANT NAMED LILAC MONEYMAKER
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 124,550
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim
1. A new and distinct cultivar of Chrysanthemum plant named Lilac Moneymaker, as described and illustrated, and parts thereof.

6,871
DIEFFENBACHIA HYBRIDA HULA
Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.
Filed Mar. 9, 1987, Ser. No. 23,608
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,872
DIEFFENBACHIA HYBRIDA BALI HAI
Edwin J. Frazer, P.O. Box 200, Kenmore, Queensland 4069, Brisbane, Australia
Filed Mar. 9, 1987, Ser. No. 23,609
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,873
DIEFFENBACHIA HYBRIDA ALOHA
Edwin J. Frazer, P.O. Box 200, Kenmore, Queensland 4069, Brisbane, Australia
Filed Aug. 28, 1987, Ser. No. 23,610
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,874
SPATHIPHYLLUM NAMED — PHOENIX
Christopher J. London, 25 North Thompson Rd., Apopka, Fla. 32703
Filed Aug. 28, 1987, Ser. No. 91,552
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Spathiphyllum as described and illustrated.

PATENTS

GRANTED JUN. 20, 1989

ERRATA

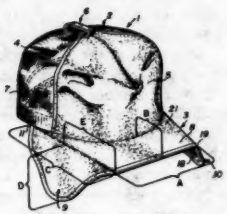
For CLASS	See PATENT NO.
350-096	4,839,970
440-078	4,840,136
138-155	4,840,194
224-274	4,840,332
277-222	4,840,379
464-111	4,840,600
464-157	4,840,601
436-111	4,840,919
503-201	4,840,927
525-327	4,841,017
546-270	4,841,035
350-006	4,841,135
388-828	4,841,206
388-811	4,841,207
346-001	4,841,306
346-001	4,841,307
346-157	4,841,337
337-248	4,841,356
368-120	4,841,500

PATENTS

GRANTED JUNE 20, 1989

GENERAL AND MECHANICAL

4,839,924
SHOOTER'S HAT HAVING FLEXIBLE SIDE BLINDER ATTACHMENTS
Harold A. Laurence, Skokie, Ill., assignor to Laurence & Laurence, Inc., Skokie, Ill.
Filed May 27, 1988, Ser. No. 199,533
Int. Cl.[4] A42B *1/06*
U.S. Cl. 2—10 **20 Claims**

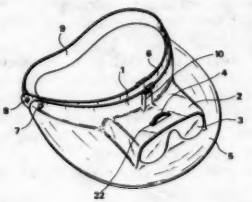


1. In a shooter's hat having in combination:
(A) a generally hemispherical crown having a peak and a generally circular margin defined by a band to generally encircle the head;
(B) a bill attached to said crown adjacent a forward portion of said margin;
(C) depending side flaps attached to said bill for restricting vision;
the improvement wherein:
(a) said bill comprises a generally planar member having a first marginal edge that extends along an arc and generally conforms to the shape of a wearer's head;
(i) said bill being attached to said crown along said arcuate first marginal edge to define a forward portion on said hat;
(ii) said bill having a generally straight second marginal edge spaced from said first edge, parallel to a chord of said arc and defining a front edge of said bill;
(iii) said second front marginal edge being shorther than a chord which extends along the diameter of the crown margin;
(iv) said bill having a pair of spaced apart, generally straight, opposed third and fourth marginal edges intersecting said first and second marginal edges;
(b) a first and a second vision-restrictive rigid side blinder attached to and depending from said third and fourth marginal edges, respectively, of said bill;
(i) said depending side blinders and said bill defining in cross-section a generally truncated A-shaped structure in its relaxed storage form;
(ii) said depending side blinders and said bill defining in cross-section a generally inverted U-shaped shaped structure in its operative stressed position upon a wearer's head providing defined horizontal and increased vertical fields of view bounded at a top and sides;
(iii) said depending side blinders flex into said U-shaped structure and said bill bows into a concave down configuration when said hat is placed operatively upon the wearer's head;
(iv) said bill and side blinders being flexibly rigid such that said side blinders are bendably positionable along their juncture with said bill yet retain their shape once operatively positioned.

4,839,925
STRETCHABLE NECKTIE
George S. Panton, Jr., 400 Coral Ave., Melbourne Beach, Fla. 32951
Continuation of Ser. No. 74,965, Jul. 17, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,654
Int. Cl.[4] A41D *25/06*
U.S. Cl. 2—146 **7 Claims**

1. A stretchable necktie comprising:
an elongated outer casing formed of an unstretched stretchable nylon-spandex material, and
an elongated inner lining secured within said, casing extending generally the length of said casing and formed of an unstretched stretchable nylon-spandex material, whereby a necktie formed generally entirely of stretchable material is formed.

4,839,926
CAP WITH BINOCULARS
Hae Y. Choi, Seoul, Rep. of Korea, assignor to Un Shik Shin, Rep. of Korea
Filed Jun. 15, 1988, Ser. No. 206,822
Int. Cl.[4] A42B *1/24*
U.S. Cl. 2—199 **13 Claims**



1. A cap with binoculars comprising:
a head band adapted to be worn on the head of a user;
a visor portion connected to said head band, said visor portion including a visor member and a binoculars receiving portion mounted on said visor member, said binoculars

receiving portion having an upper surface with an opening therein;

binoculars mounted within said binoculars receiving portion and adjustable therein according to distance for the eyes of the user wearing said head band, said binoculars having an adjusting knob adjustable by the user through said opening;

a pin connecting means for connecting said visor portion to said head band such that said visor portion is movable between first and second positions relative to said head band when worn by the user, said visor portion when in the first position being positioned so that the user can see underneath said visor member, said visor portion when in the second position being positioned so that the user can look through said binoculars mounted in said binoculars receiving portion; and

a latching means for releasably latching said visor portion relative to said head band in the first position when raised thereto.

4,839,927

DRAINAGE SYSTEM IN MULTI-STORY BUILDING

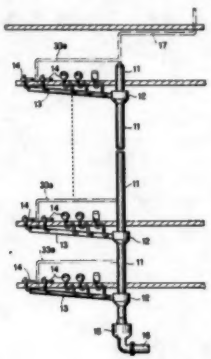
Takashi Watanabe, Tokyo, Japan, assignor to Nishihara Engineering Company, Ltd., Tokyo, Japan

Filed Aug. 6, 1987, Ser. No. 82,317

Claims priority, application Japan, Nov. 14, 1986, 61-269946; Nov. 21, 1986, 61-276820

Int. Cl.[4] E03D 9/04

U.S. Cl. 4—211 **16 Claims**



1. A drainage system including:

a stack which comprises an upper end and a lower end and a plurality of segments, including a top segment, aligned approximately vertically through the floor of each story of a multi-story building, the upper end of the top stack segment being open to the atmosphere;

a plurality of connectors each disposed between adjacent said segments;

each of said plurality of branch pipes connected to one or more fixtures which discharge waste water, each of said plurality of branch pipes being further connected at one end thereof to the stack through one of said plurality of connectors to conduct said waste water from said fixtures to the interior of said stack; and

a lower end connector for connecting the lower end of said stack to a horizontal pipe,

characterized in that each of said plurality of stack segments is provided with a cylindrical outer member and a cylindrical inner member which is inserted into said outer member coaxially to form an axially extending space annular in cross section between the outer surface of said inner member and the inner surface of said outer member, the inside space of said inner member serving as a passage for said waste water or a drainage passage and said space annular in cross section formed between said inner and said outer member serving as a passage for air or a vent passage, and that each of said plurality of connectors is provided with a generally cylindrical outer member connected to said adjacent stack segments, an upper stack segment of said adjacent stack segments being positioned just above each of said plurality of connectors and a lower stack segment of said adjacent stack segments being positioned just below each of said plurality of connectors, each of said plurality of said connectors being provided with a generally cylindrical inner member inserted into said outer member coaxially, with a space annular in cross section being formed between said outer member and said inner member of each of said plurality of connectors, which space serve as a vent passage for communication between a vent passage of the upper stack segment and that of the lower stack segment, the space formed inside said connector inner member serving as a drainage passage for communication between said drainage passage of said upper stack segment and that of said lower stack segment, each of said plurality of connectors being further provided with at least one inlet pipe which is disposed so as to extend through said connector outer member in a direction approximately coincident with a tangent to a circle formed by the inner peripheral surface of said connector inner member and which is connected at one end thereof to a corresponding branch pipe and is open at the opposite end thereof to said inner peripheral surface of said connector inner member.

4,839,928

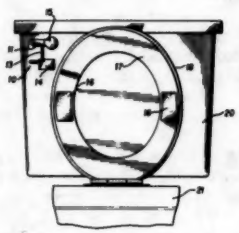
DEVICE FOR LOWERING TOILET SEATS

Timothy C. Probasco, 5716 Plainfield Ave., Apt. 4 A, Baltimore, Md. 21206

Filed Jul. 15, 1988, Ser. No. 220,009

Int. Cl.[4] A47K 17/02

U.S. Cl. 4—251 **5 Claims**

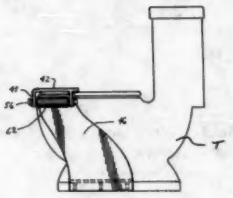


1. A toilet seat lowering device for use with a toilet having a seat, lid, and bowl rim, comprising, a structure having sleeve means adapted to be mounted over member the handle of a toilet, a wedge shaped member which is movably engageable between the toilet lid and toilet seat of a toilet when in their raised position, and a flexible means connecting said sleeve means, with respect to said wedge shaped member such that when said handle is rotated, said wedge shaped member is moved between said toilet lid and seat to therby cause said seat to fall onto said toilet rim.

4,839,929
AUXILIARY TOILET SEAT

M. Jane Mai, 10704 W. 108th Ter., Overland Park, Kans. 66210, and Maxine Hargrave, 802 N. State St., Jerseyville, Ill. 62052

Filed Mar. 18, 1988, Ser. No. 170,007
Int. Cl.[4] A47K *13/00*
U.S. Cl. 4—254 3 Claims



1. An auxiliary toilet seat, adapted to be mounted to a toilet secured in a public rest room by floor mounting bolts, said auxiliary toilet seat comprising:

a pair of spaced vertical legs;

each of said legs having a top portion and a bottom portion;

a bench seat having a generally flat top surface and a transverse front wall;

said bench seat having a first end and a second opposite end;

hinge means pivotally connecting said first end of said bench seat to said top portion of one of said legs;

handle means adjacent said second opposite end of said bench seat, whereby said bench seat may be moved between vertical and horizontal positions;

a horizontal mounting flange adjacent said bottom portion of each of said legs;

said mounting flanges extending inwardly, toward said bench seat;

a pair of generally triangular support ribs extending along each of said legs and connected with said mounting flanges;

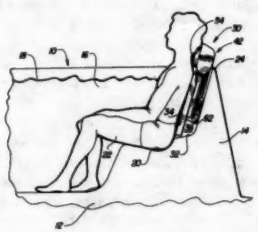
said vertical legs each having an arcuate forward curvature providing a cantilever support for said bench seat; and

a plurality of spaced apertures in each of said mounting flanges for mounting said bench seat with said toilet floor mounting bolts.

4,839,930
DRY HYDRO-MASSAGE UNIT FOR A SPA TANK

Jonathan Watkins, Vista, Calif., assignor to Watkins Manufacturing Corporation, Carlsbad, Calif.

Filed May 27, 1988, Ser. No. 199,971
Int. Cl.[4] A61H *37/00*
U.S. Cl. 4—546 22 Claims



1. A dry hydro-massaging unit for mounting in a peripheral wall of a spa tub having a top rim, said dry hydro-massaging unit comprising:

a hydro-massage jet assembly having a discharge jet and means for movably mounting, said hydro-massage jet assembly within the peripheral wall of the spa tub;

means connected to said hydro-massage jet assembly for supplying a massaging fluid to said discharge jet; and

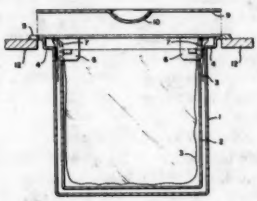
a diaphragm sealingly covering said discharge jet whereby said massaging fluid from said discharge jet massagingly flexes said diaphragm;

said means for mounting said hydro-massage jet assembly allows said assembly to be movable within the peripheral wall of the spa tub such that said diaphragm covered discharge jet is selectively movable between a first position below the top rim of the spa tub and second position above the top rim of the spa tub.

4,839,931
COUNTER TOP WASTE DISPOSAL UNIT

James A. Pontbriand, P.O. Box 550, Cardinal, Ontario, K0E 1E0, Canada

Filed Aug. 10, 1987, Ser. No. 83,172
Claims priority, application Canada, Jun. 9, 1987, 539245
Int. Cl.[4] E03C *1/00*
U.S. Cl. 4—629 1 Claim



1. A receptacle for waste disposal which is adapted to be recessed in a counter-top, comprising:

an outer, rectangular, one-piece container, said outer container having a bottom, two long sides and two short sides defining a sealed shell with an open top and an upper edge shaped to form a lower outwardly directed flange portion, a small vertical step portion formed on the outer peripheral edge of said flange portion, and an upper outwardly directed flange portion formed at the top of said step portion and extending around the open top of the outer container, forming a flat, horizontal rim, said upper flange portion for resting on a counter top in substantially the same plane as the counter-top to support the receptacle;

an inner container nested in and supported by said outer container, said inner container having a bottom, two long sides and two short sides defining a sealed shell with an open top and an upper edge portion having a horizontal outwardly directed flange along each of said long sides and an upwardly and outwardly curved flange along each of said short sides, said flanges along said long sides of said inner container adapted to rest on and be supported by said lower flange portions of said long sides of said outer container, whereby waste material can be placed into the container or swept into the container across each long side, said short side flanges forming handles having upper edges having a height slightly less than said vertical step portion of said outer container, whereby said inner container is supported in and is removable through the open top of, said outer container; and

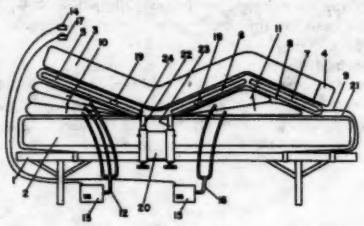
a clamping mechanism attached to the walls of the outer container to clamp and secure said outer container to a counter-top.

4,839,932

ADJUSTABLE BED SYSTEM

Robert M. Williamson, 1708 Matthews Rd., Austin, Tex. 78745

Filed May 26, 1987, Ser. No. 54,203
Int. Cl.[4] A47G 7/06; A47C 20/08
U.S. Cl. 5—68 8 Claims



1. An adjustable bed system comprising:

A. a three section hinged mattress support frame;

B. fastening means (20) to hold said three section mattress support frame to a bed (1) above a box springs (2) and below a mattress (3);

C. a spongy resilient material (26) up to 3" thick contained within the perimeter of said three section hinged mattress support frame with a cloth covering (8) to contain said three section hinged mattress support frame and said spongy resilient material (26); said cloth covering (8) having suitable openings to allow connection of said three section hinged mattress support frame to said fastening means (20);

D. tie down straps (9) to loosely anchor the leg end of said three section hinged mattress support frame to bed (1);

E. a first inflatable means (10) below a head end of said three section hinged mattress support frame to raise and lower said head end and a second inflatable means (11) below a leg end of said three section hinged mattress support frame to raise and lower said leg end;

F. a first means comprising a first motor-blower unit (13) with suitable valves and switches to inflate and deflate said first inflatable means (10) and a second means comprising a second motor-blower unit (15) with suitable valves and switches to inflate and deflate said second inflatable means (11).

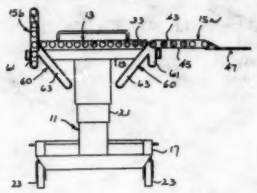
4,839,933

PATIENT TRANSFER AND CONVEYING VEHICLE

William B. Plewright; Kenneth O. Weir, and Richard J. Patterson, all of C/-85 Napier Street, Cottesloe, Australia

PCT No. PCT/AU86/00240, § 371 Date Apr. 13, 1987, § 102(e) Date Apr. 13, 1987, PCT Pub. No. WO87/01030, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 13, 1986, Ser. No. 56,480
Claims priority, application Australia, Aug. 13, 1985, PH1921
Int. Cl.[4] A61G 7/08; A47C 21/08
U.S. Cl. 5—81 R 11 Claims

1. A handling device for aiding patient transfer between two support surfaces when such surfaces are positioned adjacent one another, said handling device comprising a body having a transfer surface, attaching means interconnecting said body to an apparatus providing one of the support surfaces, said attaching means providing for pivotal and sliding movement of said body relative to said apparatus between first second and third positions, in the first position said transfer surface bridges said support surfaces, in the second position the body extends upwardly of said apparatus to provide a safety barrier therefor and in the third position said transfer surface extends in a



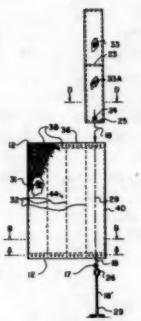
downwardly inclined direction from a side of said apparatus to underlie its support surface.

4,839,934

MULTIPLE COMPONENT COMFORTER QUILT

Robert R. Rojas, 300 E. 33rd St., Box 268, New York, N.Y. 10016

Continuation-in-part of Ser. No. 864,823, May 19, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 108,106
Int. Cl.[4] A47G 9/02
U.S. Cl. 5—502 18 Claims



1. System of bed coverings adapted to cover beds of different standard sizes, said set comprising:

(a) a plurality of cover units of different sizes, each cover unit having a plurality of individual compartments of substantially the same size;

(b) a plurality of heat insulator units each having substantially the same size, at least one for each of said individual compartments, wherein

said individual compartments are arranged to receive and retain said heat insulator units,

said heat insulator units are arranged to be insertable and removable from said compartments of said cover units, and

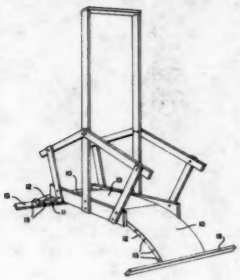
said heat insulator units are arranged to be of a predetermined size and shape such that a first predetermined number of said heat insulator units in a cover unit having a first predetermined number of individual compartments will comprise a bed covering for a first standard sized bed, while a second predetermined number of said heat insulator units in a cover unit having a second predetermined number of individual compartments will comprise a bed covering for a second standard size bed whereby a plurality of the substantially uniformly sized heat insulator units may be used with different cover units of the system of bed coverings.

4,839,935

MINI ARCHED BRIDGE

Robert A. Calcagni, Poland, and Alexander Sheppa, Hubbard, both of Ohio, assignors to Commercial Shearing, Inc., Youngstown, Ohio

Filed Jul. 13, 1987, Ser. No. 73,074
Int. Cl.[4] E01D 15/12
U.S. Cl. 14—24 14 Claims



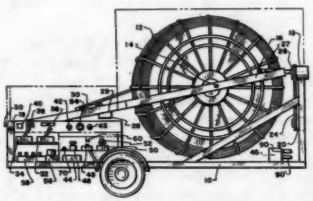
1. A mini arched bridge comprising at least two rigid hollow pans having integral downwardly depending ends and sides forming a unitary structure, each of said pans having an arcuate upper surface arching upwardly in use to support downward loads thereon, said at least two arched pans forming the entire upper surface of said bridge, said ends and sides of each pan extending completely around the perimeter of the pan to provide increased strength and rigidity to the pan and each side and end having comparable holes, a plurality of fasteners passing through the holes in the adjacent ends of each of said at least two pans, and, the ends remote from the connection adapted for placement into the earth on opposite sides of an area to be bridged, whereby said pans become a single arched member.

4,839,936

AUTOMATED SEWER CLEANING RODDING MACHINE

Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Company, Lima, Ohio

Continuation-in-part of Ser. No. 128,460, Dec. 3, 1987. This application May 10, 1988, Ser. No. 191,583
Int. Cl.[4] B08B 9/02
U.S. Cl. 15—104.33 12 Claims



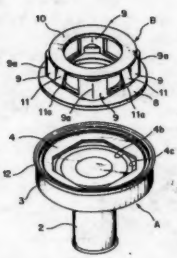
1. A sewer rodding cleaning machine comprising:
a chassis frame;
a rotatable carriage mounted on said frame;
a rod storage reel rotatably mounted on said rotatable carriage;
carriage drive means for rotating said carriage;
said carriage drive means including rotation selection control means;
rod feed drive means for feeding rod into a sewer line:
said rod feed drive means including rod feed direction selecting control means for selectively feeding said rod out or back;
sensing means sensing resistance to movement of said rod:
rod travel reversing means for reversing rod travel;
said sensing means activating said rod travel reversing means;
said rod travel reversing means reversing the direction of travel of said rod for a predetermined distance;
rod feed restoring means for restoring rod travel to the original direction after said rod has traveled said predetermined distance;
rod direction selection control means for reversing the normal operation of said rod feed drive means from feeding rod out and reversing to feed rod back to feeding rod back to reversing to feed rod out;
whereby said rod may be cyclically moved into and out of a sewer line blockage until said blockage is cleared.

4,839,937

GROMMET STRUCTURE

Ryuetsu Oikawa, and Akihiko Fujita, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,029
Claims priority, application Japan, Jul. 15, 1987, 62-107512[U]
Int. Cl.[4] F16L 5/02
U.S. Cl. 16—2 5 Claims



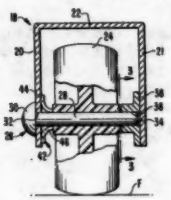
1. A grommet for insertion in a hole in a panel comprising:
a soft grommet body, including a supporting portion, arranged such that an electric wire insertion hole is formed in an inner peripheral portion of a hollow disc-like base at one end of said soft grommet body, a peripheral wall crookedly formed along an outer periphery of said hollow disc-like base, and a tip portion of said peripheral wall being further bent inwards to provide said supporting portion;
a hard resinous lock member comprising an angular pillar, including a bottom wall, having a substrate fitted in annular recess defined by said base, said peripheral wall and said supporting portion; said angular pillar also having a plurality of angular portions each adapted for fitting in said hole of said panel; stop members attached to the outer periphery of said bottom wall of said angular pillar for providing a locking force in said hole,
wherein an inner periphery of said supporting portion of said soft grommet body assumes an angular configuration having a plurality of corners contiguous to said plurality of angular portions of said angular pillar.

4,839,938

FURNITURE HAVING WHEEL AXLES CONCEALED ON ONE SIDE

J. Thayer Coggin, High Point, and Robert R. Hilton, Thomasville, both of N.C., assignors to Thayer Coggin Incorporated, High Point, N.C.

Filed Apr. 10, 1987, Ser. No. 36,745
Int. Cl.[4] A47B 91/00; B60B 33/00
U.S. Cl. 16—45 21 Claims



1. In an article of furniture having a furniture body and at least one wheel for rollably supporting at least part of the body on the floor, wheel supporting and concealing structure comprising:

an inverted U-shaped channel member having parallel depending flanges interconnected by an upper bight portion, said channel member being secured to the lower part of the furniture body adjacent the floor and dimensioned to receive the wheel between said flanges and conceal the majority of the height of the wheel behind said flanges;

a headed axle having a cylindrical shank and an enlarged head at one end thereof, for rotatably supporting the wheel between said flanges;

an axle-receiving aperture in only one of said flanges for supporting the headed end of said axle with said shank projecting into and substantially across said channel and said head abutting the outer surface of said one flange;

axle supporting means in said channel on the other of said flanges and aligned with said aperture for supporting the distal end of said axle shank, said other flange being imperforate in the region of said axle supporting means to conceal said axle and said axle supporting means from external view; and

axle retaining means in said channel, concealed from external view, for engaging said axle and retaining it in position in said channel, whereby only said head of said axle and the minor portion of the wheel projecting below said flanges are exposed to view.

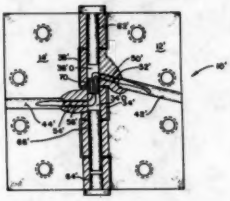
4,839,939

SECURITY HINGE WITH IMPROVED STRUCTURAL INTEGRITY WITH THE ELECTRICAL WIRES LOCATED ALONG THE PIVOT AXIS OF THE KNUCKLES

James A. O'Brien, II, 1331 W. Outer 21 Rd.-Lower Level, P.O. Box 405, Arnold, Mo. 63010-0405

Filed Mar. 24, 1988, Ser. No. 172,390
Int. Cl.[4] E05D 3/06
U.S. Cl. 16—223 12 Claims

1. A security hinge having electrical control wires passing axially in a completely uncoiled manner-- has been inserted; there through comprising a pair of cooperating leaves having fastener openings adapted to enable the attachment of the respective leaves to a fixed member and a movable member; each of said leaves including knuckle means adapted to align and co-engage to receive pin means to hold the knuckle means in vertical alignment; said knuckle means comprising at least two knuckles; each of the knuckle means including an aligned vertical axis and having aligned pin openings extending along said axis receiving the uncoiled electrical wires and the pin means to retain the assembly in place; each of said leaves including slot means extending generally transversely through the leaf and being spaced from said openings sufficiently to avoid reducing the structural integrity of the body of said leaves; each of said slots being in fluid communication with at least one opening extending from the end of the slot into an axial opening located within one of said knuckle means, the control wires extend through the slots in each of the leaves and



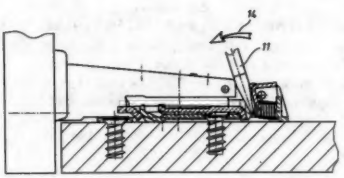
through the openings in each of leaves and through the aligned openings along said vertical axis in the knuckles within said hinge, and said wires pass uncoiled through no more than two said knuckles; and the pin means including upper and lower pin members including a first upper pin member extending through the uppermost knuckles and a second lower pin member extending through the bottomost knuckles.

4,839,940

RAPIDCY MOUNTABLE FURNITURE HINGE WITH SNAP CLOSURE

Alfred Grass, Höchst, Austria, assignor to Alfred Grass Ges.m.b.H. Metallwarenfabrik, A-6973 Hoechst/Vlbg., Austria

Filed Nov. 16, 1987, Ser. No. 120,907
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1986, 3639276
Int. Cl.[4] E05D 7/12
U.S. Cl. 16—258 6 Claims



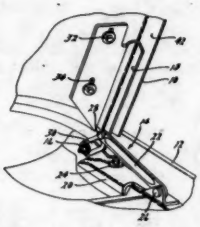
1. A rapidly mountable furniture hinge associated with a housing carried by a door and fastenable to a furniture part, said hinge comprising: a mounting plate secured to the furniture part having a fitting connection formed therein; a hinge arm moveably connected to the housing; a mounting plate top section adjustably securd to said hinge arm having a tang at one end directly downwardly at an angle away from the door for engagement with said mounting plate fitting connection and a plurality of tangs at the other end directed downwardly at angles away from the door; and a rotary slider moveably affixed to said mounting plate proximate the furniture part having a spring contiguous thereto and a forward inclined locking edge inclined in a direction opposite to the direction of inclination of the plurality of tangs engageable with said plurality of tangs to secure said mounting plate to said mounting plate top section as said spring urges to locking edge and said plurality of tangs in a locking relationship, said mounting plate top section tang and said mounting plate fitting connection releasably engaging each other when said slider locking edge engages said plurality of tangs to form a hinge snap closure.

4,839,941

ELEVATING AND TRAVERSING HOOD HINGE

James A. Orlando, Troy, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,106
Int. Cl.[4] E05D 15/22
U.S. Cl. 16—361 1 Claim



1. A hinge assembly for controlling movement of a hood between closed and opened position with respect to an automotive vehicle body comprising:

a first plate having a first end and a second end and being secured to the body;

a pivot bolt secured to the first plate at the first end thereof;

a second plate having a first end and a second end and being secured to the hood;

means defining an elongated slot in the second plate for receiving the pivot bolt for permitting simultaneous pivotal and translation movement with respect thereto while simultaneously permitting upward and forward movement of the hood with respect to the body; and

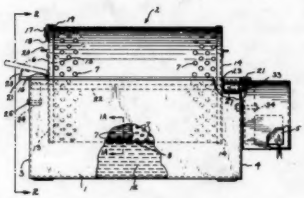
an elongated stabilizing rod pivotally connected at one end to the first plate at the second end of the first plate and pivotally connected at its other end to the second plate at the first end of the second plate, the other end pivotal connection being located at one end of the slot while also being inbetween the slot and an edge of the hood, said elongated slot being located at the first end of the second plate while also being spaced outwardly from and at an angle to the edge of the hood.

4,839,942

FISH SCALING APPARATUS

James B. Damp, P.O. Box 167, Abrams, Wis. 54101

Filed Jan. 15, 1988, Ser. No. 144,235
Int. Cl.[4] A22C 25/02
U.S. Cl. 17—64 18 Claims



1. A fish scaling apparatus for removal of scales from a fish without brusing the edible body portion comprising,

a trough-shaped tank having a bottom and sidewall portions and first and second end walls secured to said bottom and sidewall portions,

a substantially closed cylindrical scaling drum having a cylindrical wall and end closure walls, said cylindrical wall being formed of metal and having a plurality of openings including inwardly projecting sidewalls having smooth inner scaling edges for scaling of fish during rotation of the drum,

a drive shaft means on said end closure walls,

first and second bearing means secured to the end walls of said trough-shaped tank and said end closure walls of said cylindrical drum, each of said first and second bearing means includes a first bearing member secured to said trough-shaped tank and a second bearing member secured to said cylindrical tank, said first and second bearing members being releasably coupled to form a rotating bearing support of said cylindrical tank and permitting manual removal of said tank without removing components from said bearing members, and

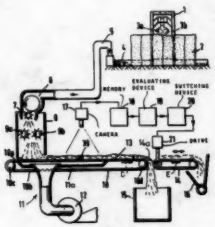
a motor means secured to one end wall of said trough-shaped tank and having an output shaft, and a releasable coupling direct connected to said output shaft and to said drive shaft means.

4,839,943

APPARATUS FOR DETECTING FOREIGN BODIES IN A FIBER TUFT MASS

Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,869
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644535
Int. Cl.[4] D01B 1/00
U.S. Cl. 19—80 R 17 Claims



1. An arrangement for ascertaining the presence of foreign bodies in, and their removal from a mass of fiber tufts, comprising

(a) a conveyor having a fiber tuft supporting surface;

(b) means for forming a loose fiber tuft layer on said surface;

(c) driving means for advancing the conveyor for moving the loose fiber layer in a conveying direction;

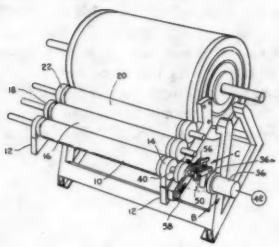
(d) a foreign body detecting apparatus arranged for scanning the fiber tuft layer for ascertaining a presence of a foreign body at a first location and including signal generating means for generating a signal upon ascertaining said presence; and

(e) a foreign body removing means operatively connected to said signal generating means for removing the foreign body at a second location upon receipt of said signal; said second location being downstream of said first location as viewed in said conveying direction.

4,839,944
FEED ROLL SENSOR FOR A TEXTILE CARDING MACHINE

John D. Hollingsworth, Greenville, and Gary H. Rookstool, Simpsonville, both of S.C., assignors to John D. Hollingsworth On Wheels, Inc., Greenville, S.C., a part interest

Filed Oct. 13, 1987, Ser. No. 107,666
Int. Cl.[4] D01G *23/06*; D01H *5/38*
U.S. Cl. 19—105 **16 Claims**

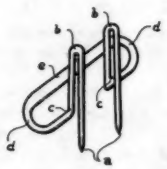


1. Apparatus sfor use in a textile machine control system for regulating the amount of textile fibers fed to said machine comprising:
(a) a fixed feed roll rotatable carried by a frame of said machine;
(b) a fixed nipping surface fixedly carried adjacent said feed roll to define a fixed nip between said feed roll and nipping surface through which said fibrous mass is fed;
(c) rotational motor drive means for rotating said feed roll;
(d) sensor means for directly and mechanically sensing a reaction of said rotational motor drive means to the torque of the feed roll produced during rotation of said feed roll and feeding said fibrous means through said nip;
(e) said sensor means generating an electrical control signal representing a quantitative condition of said fibrous mass for use in regulating said rotational drive means in a manner that a prescribed quantity of said fiber mass is fed to said machine.

4,839,945
INVISIBLE TIE TAIL HOLDER

Zane A. Price, 6248 Gentle La., Alexandria, Va. 22310, and Douglas P. Bentley, 8528 Cyrus Pl., Alexandria, Va. 22308

Continuation of Ser. No. 141,005, Jan. 5, 1988, abandoned. This application Oct. 4, 1988, Ser. No. 253,958
Int. Cl.[4] A41D *25/00*
U.S. Cl. 24—49 R **4 Claims**

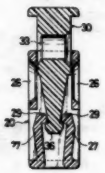


1. An invisible tie tail holder comprising:
a "c"-shaped holder having a c-body portion and including two curved outer end portions and two inner-end portions, said "c"-shaped holder being oriented for installation in a horizontal plane about a tie tail;
a pair of pin members oriented for vertical installation in the back of the front of a tie, said pin members each having a first end, a second end, and an intermediate portion; each first end being pin-shaped for pin-engagement with the front of the back of said tie, said intermediate portions being bent into an inverted "J"-shaped member having upper and lower ends wherein each said pin-shaped first end of said pin member is located at said lower end of said inverted "J"-shaped member and each said upper end of said inverted "J"-shaped member extends to and connects with said second end of said pin members which is affixed to a different one of said two inner-end portions of said "c"-shaped holder; and,
wherein said curved outer end portions of said "c"-shaped member extend horizontally beyond said pair of vertical pin members.

4,839,946
CORD LOCK

Ryukichi Murai, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,484
Claims priority, application Japan, May 1, 1987, 62-66288[U]
Int. Cl.[4] F16G *11/04*
U.S. Cl. 24—115 G **14 Claims**

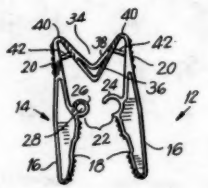


1. A cord lock comprising:
(a) a one-piece socket molded of synthetic resin and having a pair of aligned lateral apertures for receiving á cord and at least one resilient flap disposed in an axial hole in said socket below said apertures; and
(b) a one-piece plug molded on synthetic resin and axially movable in said socket, said plug having a transverse through-hole alignable with said lateral apertures for movement of the cord therethrough, and a wedge-shaped end portion engageable with said resilient flap and coacting with the latter for urging said plug to move axially upwardly under the resiliency of said resilient flap.

4,839,947
CLAMP MECHANISM

Robert Cohen, 310 E. 46th St., New York, N.Y. 10017, and Betty J. Charak, 343 E. 30th St., New York, N.Y. 10016

Filed Jul. 14, 1988, Ser. No. 219,962
Int. Cl.[4] A41F *1/00*; A44B *21/00*
U.S. Cl. 24—499 **5 Claims**



1. A clamp formed of a unitary piece of resilient material comprising first and second arms, each of said arms having a jaw portion terminating at a first arm end joined to a finger-grip portion terminating at a second arm end, said jaw portions each including an inwardly-directed face adapted to jointly

engage an object sought to be gripped between said jaw portions, an integral hinge member located on said arms between said finger-grip and jaw portions and comprising a first hinge member element on said first arm and a second hinge member element on said second arm, said first and second elements being engageable together to form a pivot point about which said arms rotate, and an integral biasing member extending between said finger-grip portion and affixed to said arms at the second ends thereof and having a pair of spacer members located between said biasing member and said finger-grip portion inwardly of said affixation points, whereby the biasing action is confined to the portion of said biasing member between said spacer members, the jaw ends of said arms being biased together about said hinge member by said biasing member.

4,839,948

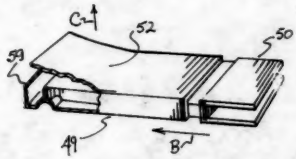
CONVERTIBLE FOOTWEAR

Leslie A. Boros, 7074 E. Aster Dr., Scottsdale, Ariz. 85254

Continuation-in-part of Ser. No. 866,777, May 23, 1986, abandoned, which is a continuation of Ser. No. 681,844, Dec. 14, 1984, abandoned. This application Oct. 6, 1987, Ser. No. 105,715

Int. Cl.[4] A41F *1/00*

U.S. Cl. 24—662 **3 Claims**



1. A clasp for detachably securing a first member to a second member, said clasp comprising:

(a) a female element couplable to said first member and including

(i) an open end,

(ii) a closed end spaced from the open end,

(iii) a pair of spaced apart edgewalls,

(iv) a first sidewall integral with said pair of edgewalls, and

(v) a second sidewall having

a first portion integral with said pair of edgewalls along a length thereof adjacent said open end, and

a second portion integrally extending from said first portion toward said closed end and independent said pair of edgewalls, said second portion being biased in a direction toward said first sidewall;

(b) a male element including

(i) a first end couplable to said second member, and

(ii) a second end spaced from said first end and receivable through the open end of said female element; and

(c) detent means for selectively and detachably retaining said male element within said female element, said detent means including

(i) a first engagement element of an engagement pair carried by one of said sidewalls at a location closer to said closed end than to said open end of said female element, and

(ii) a second engagement element of said engagement pair being complemental to said first engagement element and carried by said male element at a location closer to the second end thereof and to the first end thereof.

4,839,949

ROLLERS FOR ROLLING MILLS

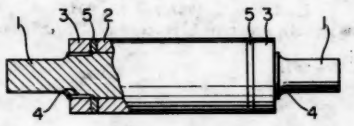
Masahisa Sobue, Mito; Sosuke Okada; Kimihiko Akahori, both of Katsuta; Keiichi Kuniya, Hitachi; Toshimi Sasaki, Mito; Toshiyuki Kajiwara, Hitachi; Tomoaki Kimura, Hitachi, and Mitsuo Nihei, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 601,358, Apr. 18, 1984, abandoned. This application May 12, 1987, Ser. No. 48,907

Claims priority, application Japan, Apr. 22, 1983, 58-69918

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—132 **19 Claims**



1. A roll for strip sheet rolling mills, the roll being mounted as a work roll in a rolling mill and being a solid cylindrical bar having an axial length larger than a diameter thereof, said roll is an entirely non-metallic sintered body comprising a principal component of at least one material selected from the group consisting of silicon carbide, silicon nitride, sialon, alumina and zirconia and has a density of at least 96% of the sintered body theoretical density, said roll having an initial crown in a range of -300 μm to $+300$ μm.

4,839,950

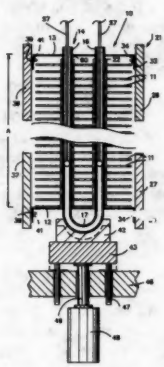
METHOD FOR MAKING A TUBE AND FIN HEAT EXCHANGER

Steven L. Stroup, Bluffton, Ind., assignor to Crown Unlimited Machine, Incorporated, Bluffton, Ind.

Division of Ser. No. 52,689, May 20, 1987, Pat. No. 4,780,955. This application Feb. 29, 1988, Ser. No. 162,013

Int. Cl.[4] B21D *53/08*

U.S. Cl. 29—157.3 C **4 Claims**



1. A method of producing heat exchangers having end sheets with fins stacked therebetween and tubes extending through said end sheets and fins expanded into tight engagement therewith, comprising loosely assembling said tubes through said end sheets and fins and thereafter progressively expanding said tubes from one end thereof causing tubes to expand into tight engagement with the end sheet adjacent to said one end of said tubes and thereafter progressively into tight engagement with said fins and the end sheet remote from said one end of said

tubes, said progressive expansion of said tubes progressively causing shortening thereof, and supporting said end sheets a predetermined fixed distance apart during said progressive expansion of said tubes so that the spacing between the end sheets is unaffected by said expansion and shortening of said tubes and said end sheets are spaced apart said predetermined distance after said tubes are expanded.

4,839,951

PROCESS FOR THE INSTALLATION OF TUBES IN A STEAM GENERATOR

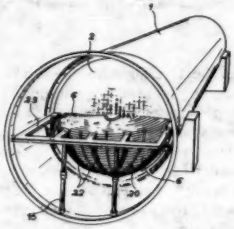
Gérard Boula, Fleursault, and Alain Georges, Verdun, both of France, assignors to Framatome, Courbevoie, France

Filed Aug. 27, 1987, Ser. No. 90,059

Claims priority, application France, Aug. 27, 1986, 86 12126

Int. Cl.[4] B21D *53/00*

U.S. Cl. 29—157.4 **5 Claims**



1. A process for the installation of tubes in the form of planar layers, separated by in particular intermediate antivibratory bars, in a steam generator, said process comprising the repetition of the following steps

(a) installing a layer of tubes;

(b) positioning intermediate bars above said layer;

(c) loading said intermediate bars by forces along said intermediate bars and perpendicular to a plane of said layer of tubes;

(d) checking a clearance between said intermediate bars and each of the tubes of said layer; and

(e) removing and replacing those of said tubes whose clearance is outside the tolerances by correct tubes.

4,839,952

PROCESS FOR MANUFACTURING TOOTHED PARTS

Michihiro Yokoyama, Anjyo, Japan, assignor to Kabushiki Kaisha Yokoyama Seisakusho, Anjo, Japan

Filed Jun. 30, 1987, Ser. No. 68,152

Claims priority, application Japan, Jul. 3, 1986, 61-156758

Int. Cl.[4] B21D *53/28*

U.S. Cl. 29—159.2 **1 Claim**

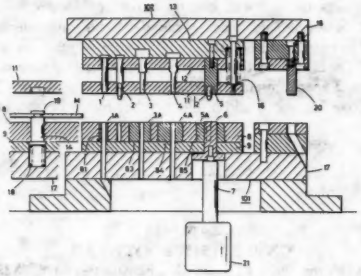
1. A process for manufacturing toothed parts having an exterior periphery defining a final tooth profile that is comprised of a finished smooth profile portion and a finished tooth profile portion and said process for manufacturing including the use of a press machine having top and bottom die sets with stock interposed therebetween at uniform intervals in sequence, said process including the steps of:

stamping a reference hole in said stock;

stamping a window hole defined by a front profile line and a back profile line substantially similar to the toothed parts in said stock while using said reference hole as a reference;

rough-forming on the back profile line of said window hole a tooth profile having a tooth width greater and a tooth height lower than the final tooth profile, the rough-formed tooth profile on one side of said window hole having a shape substantially similar to the finished tooth profile portion, and the front profile line of said window hole having a shape substantially similar to the finished smooth profile portion;

stamping a partially fabricated part through a die bushing in a female die with a finish punch that has a shape similar to that of the toothed parts, the die bushing through which said partially fabricated parts is passed having a 40°–100°



chamfer around substantially an entire circumference of an upper inlet and a 90°–150° chamfer at a lower inlet of the die bushing; and

ironing said partially fabricated part with a finishing counter and thereby notching the tooth profile in a substantially identical shape to the tooth profile formed by said finish punch.

4,839,953

MAGNETIC DISK CARTRIDGE ASSEMBLY SYSTEM

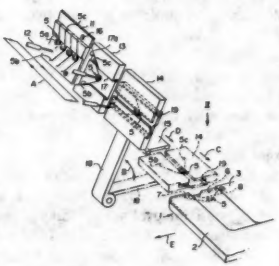
Akira Mizuta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1987, Ser. No. 140,270

Claims priority, application Japan, Jan. 9, 1987, 62-2899

Int. Cl.[4] B23P *19/04;* **B65H** *3/00;* **G11B** *5/82;* **B65B** *69/00*

U.S. Cl. 29—225 **8 Claims**



1. A magnetic disk cartridge assembly system for assembling a magnetic disk cartridge having a casing for accommodating therein a magnetic disk, a shutter which is slidably mounted on the outer surface of the casing, and a substantially V-shaped shutter spring which urges the shutter toward a predetermined direction and is inserted into the casing through a spring insertion opening to abut against an engaging portion on the casing at one end and against an engaging portion on the shutter at the other end under its own resiliency, comprising a guide member which has a guide groove for holding the shutter spring in a compressed state and is adapted to bring a first end of the guide groove in close opposition to the spring insertion opening of the casing, the width of the guide groove being not larger than that of the spring insertion opening at least at the first end, and a movable insertion means which is adapted to move the spring

along the guide groove and to insert it into the spring insertion opening through the first end of the guide groove.

4,839,954

MANIPULATION DEVICE FOR HOSE MOUNTING

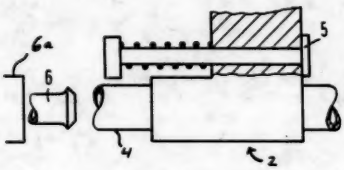
Gunter Hartmann; Ralf Swoboda, both of Munich, and Robert Lang, Syrgenstein, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,315

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1986, 3614362

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—235 **16 Claims**



1. A manipulation device for use with an industrial robot for automatically mounting hoses having different diameters onto corresponding fittings, comprising:

turret base member;

at least three double-jaw grippers arranged on said turret base member, each of said grippers corresponding to a different predetermined hose diameter;

means for actuating each of said grippers; and each of said gripper being attached to said turret base member at an angle thereto, thereby allowing said gripper to grip a hose being held by a means for holding the hose in a defined position and to cause a predetermined length of hose to be obtained from a hose supply.

4,839,955

METHOD FOR MOUNTING AND REMOVING SCREWS OF AN EXTRUSION MACHINE

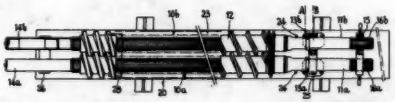
Jean Vannier, Mesvres Etang Sur Arroux, France, assignor to Clextral, Courbevoie, France

Filed Dec. 2, 1987, Ser. No. 127,998

Claims priority, application France, Dec. 2, 1986, 86 16817

Int. Cl.[4] B23P *7/00*

U.S. Cl. 29—402.08 **2 Claims**



1. Method for selectively removing and mounting screws of an extrusion machine which comprises first and second screws driven in rotation and guided at opposite ends thereof by a bearing forming with the screws a screw-bearing assembly, each of said screws comprising a central driving shaft having splines, a plurality of hollow screw sections mounted on the driving shaft and having an inner wall defining grooves which are in engagement with the splines of the central shaft, and extrusion treating means on the periphery of the screw sections, said method comprising the steps of

(a) preparing a work table for simultaneously receiving the two screws, the table being provided with adjustable support means for the screws, extracting with the aid of hoisting means the screw-bearing assembly of the extrusion machine, and placing said assembly on the work table;

(b) removing the bearings and placing in position on one end of each of the two shafts a jig for locating an initial position of the splines and for maintaining the distance between the axes of the screws, and placing a protective sleeve on another end of each of the shafts;

(c) checking the dimensions of the flights of the screw sections for determining the defective sections to be repaired or replaced;

(d) removing the screws from the work table and preparing said work table for placing in position one of the screws;

(e) placing said first screw on the work table, and successively extracting the sections by means of suitable tooling and a single section-hoisting device;

(f) placing said second screw on the work table, and successively extracting the sections by means of said tooling and single-section hoisting device;

(g) after withdrawing the second splined shaft from the work table, preparing said table for placing the two splined shafts in position;

(h) placing the two splined shafts on the work table, and placing the jig back in position on one of the ends of the shafts for positioning said splined shafts and resuming said initial position of the splines;

(i) simultaneously sliding, by means of a double section-hoisting device, a new section on each splined shaft, and repeating the operation for each pair of new sections;

(j) removing the protective sleeve and the jig from each shaft;

(k) putting the bearing corresponding to each end of the shafts back in position; and

(l) remounting the screw-bearing assembly in the extrusion machine.

4,839,956

METHOD OF AND APPARATUS FOR ATTACHING TOP STOPS TO SLIDE FASTENER CHAIN

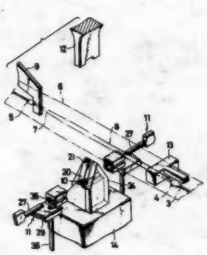
Tatsuo Osaki, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,897

Claims priority, application Japan, Apr. 25, 1987, 62-102811

Int. Cl.[4] B21D *53/50*

U.S. Cl. 29—408 **6 Claims**



1. An apparatus for automatically attaching a pair of horizontal U-shaped top stops of synthetic resin to a continuous slide fastener chain including a pair of tapes and a pair of coupled rows of fastener elements mounted on and along respective inner longitudinal edges of the opposed tapes, there being a plurality of element-free spaces spaced at equal distances along the slide fastener chain, said apparatus comprising:

(a) means for supporting the slide fastener chain in tension along a horizontal path;

(b) an anvil and an upper jaw for defining a pair of pockets to clamp the top stops each on its upper and lower sur-

faces, said upper jaw being movable with respect to said anvil so as to release the upper surface of each said top stops, said anvil and said jaw being normally disposed below the path of the slide fastener chain and upwardly movable until said pockets are horizontally aligned with the opposed inner tape edges, said upper jaw having a substantially triangular head for insertion into a space between the opposed inner tape edges in response to the upward movement of said anvil and said upper jaw; and

(c) a thrusting member normally disposed below the path of the slide fastener chain and upwardly movable upon completion of attaching of the top stops, said thrusting member having a substantially triangular upper end for insertion between the opposed inner tape edges in response to the upward movement of said thrusting member to remove the top stops out of said pockets.

4,839,957

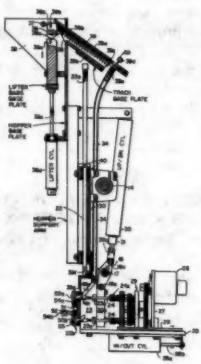
METHOD OF APPLYING A DOOR HINGE

Erling S. Jangaard, Maderia Beach, Fla., assignor to Ruvo Automation Corporation, Largo, Fla.

Division of Ser. No. 932,265, Nov. 19, 1986, Pat. No. 4,782,588. This application Apr. 6, 1988, Ser. No. 178,310

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—434 **5 Claims**



1. A method of securing with screw members the opposing flaps of a hinge member to a door and a door jamb at the same time, comprising the steps of:

positioning a door and a door jamb at a remote location;

periodically delivering to said remote location as many screw members as required to secure the flaps of a hinge member to said door and door jamb;

accomplishing said periodic delivery by moving a screw member-carrying element between a first position where it receives a charge of screw members and a second position adjacent said remote location;

delivering screw members to said element when said element is in its upward and outward position by means of a plurality of elongate conduit means which do not move during the performance of any step of the method;

positioning respective charging ends of said non-moving conduit means in communication with associated queues of said screw members;

transferring the lead screw member from each queue of screw members by an escapement means and delivering said screw members to charging ends of associated conduit means;

adding screw members to said queues by lifting them from a pile of randomly oriented screw members positioned within a hopper means;

accomplishing said lifting by reciprocating between an uppermost and a lowermost position an upstanding lifting means positioned within said hopper means;

forming a slot means in the uppermost end of said lifting means so that the shank portion of a screw member may enter said slot means at the same time its head portion is abuttingly engaged by the uppermost end of said lifting means adjacent said slot means so that said screw member is lifted from said pile attendant upward reciprocation of said lifting means;

propelling screw members lifted out of said pile by said lifting means to a storage area in the form of a queue so that said lifting means is empty and thus capable of lifting another screw member when it makes a subsequent reciprocation through said pile of screw members;

and propelling said screw members from said lifting means to said storage area under the influence of air under pressure.

4,839,958

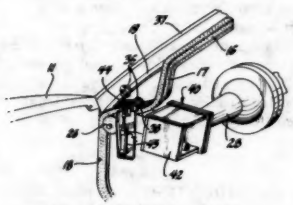
METHOD OF USING A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

Stephen St. Angelo, Jr., Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 944,649, Dec. 22, 1986, Pat. No. 4,760,636, which is a continuation-in-part of Ser. No. 888,238, Jul. 18, 1986, Pat. No. 4,715,110. This application Feb. 29, 1988, Ser. No. 161,500

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—450 **10 Claims**



1. A method for utilizing a robot with an arm and a variable rotational velocity pressure roller to install fixed lengths of weather stripping, stored in a loading station, into a body opening including generally straight sections and corner sections, said method in combination comprising:

loading said robot arm with one of said fixed lengths;

transferring said fixed length from said loading station to said body opening;

interacting and tracing said pressure roller along a straight section at a first linear speed and at a first rotational speed and interacting and tracing said pressure roller along a corner section at a second linear speed differing from said first linear speed and at a second rotational speed differing from said first rotational speed whereby said fixed length is guided and affixed with said sections as said fixed length is installed into said body opening.

6. A method for utilizing a robot with an arm and a variable rotational velocity pressure roller thereon to install a fixed length of weather stripping into a body opening including generally straight sections and corner sections, said method in combination comprising:

interacting and tracing said pressure roller along a straight section at a first linear speed and at a first rotational speed and interacting and tracing said pressure roller along a corner section at a second linear speed differing from said first linear speed and at a second rotational speed differing from said first rotational speed whereby said fixed length

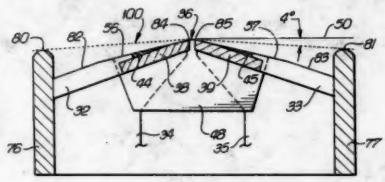
is guided and affixed with said sections as said fixed length is installed by said robot into said body opening.

4,839,959

METHOD OF FORMING A MAGNETIC HEAD

Roger L. Mersing, Mission Viejo, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Oct. 22, 1987, Ser. No. 111,998
Int. Cl.[4] G11B 5/42
U.S. Cl. 29—603 **10 Claims**



1. A method of forming a magnetic head comprising the steps of:

providing a head having a body with a tape facing surface;

coupling at least one guide member to the body of magnetic head wherein an edge of the guide member extends beyond the tape facing surface of the magnetic head and the guide member edge has a predetermined positioned relationship with respect to the tape facing surface; and

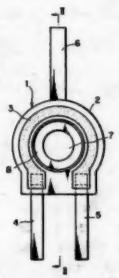
simultaneously lapping the edge of the guide member and a portion of the tape facing surface of the magnetic head to form a predetermined beveled contour on the tape facing surface determined by said positional relationship.

4,839,960

METHOD OF MANUFACTURING CIRCUIT COMPONENT SUCH AS STATOR FOR VARIABLE RESISTOR

Tsutomu Yokoi; Hiroji Tani; Tohru Kasanami; Norio Fukui, and Keizou Yamamoto, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 25, 1988, Ser. No. 198,326
Claims priority, application Japan, May 29, 1987, 62-136087; May 29, 1987, 62-136088; Oct. 23, 1987, 62-268749
Int. Cl.[4] H01C 17/06
U.S. Cl. 29—620 **13 Claims**



1. A method of manufacturing a circuit component comprising a substrate of resin and a film electrical element provided on the surface of said substrate, said method comprising:

a step of preparing a heat resistant film;

a step of providing a desired film electrical element on said heat resistant film;

a step of preparing a forming die having a cavity for forming a substrate;

a step of locating said heat resistant film provided with said film electrical element in said forming die to expose at least a part of said film electrical element in said cavity; and

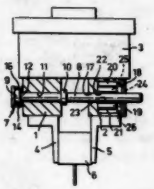
a step of introducing resin into said cavity to form by said resin a substrate joined with said at least a part of said film electrical element.

4,839,961

GRIPPING DEVICE

Adrianus J. P. M. Vermeer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 158,523, Feb. 22, 1988, abandoned. This application Sep. 19, 1988, Ser. No. 248,245
Claims priority, application United Kingdom, Mar. 11, 1987, 8705716
Int. Cl.[4] H05K 3/30
U.S. Cl. 29—740 **8 Claims**



1. A gripping device for an apparatus for placing components on a substrate, the device comprising a pair of grippers, each of which comprises a gripper jaw and at least one of which is movable relative to the other to close and open the jaws for gripping and releasing a component, characterised by a stroke-limiting device which is arranged for abutment with a first gripper of said pair of grippers after an initial relative movement between the grippers in the direction to open the jaws so as to limit said initial relative movement between the grippers in this direction, the stroke-limiting device comprising an abutment member which is capable of limited movement relative to said first gripper in the directions of relative movement between the grippers and which has an abutment surface for cooperation with an abutment surface on the first gripper to limit said relative movement of the abutment member in one direction, means being provided for urging the abutment member in the opposite direction to a position in which the abutment surfaces are spaced from one another, and means being provided for locking the abutment member to the second gripper of said pair of grippers against movement relative thereto at least in one direction such that initial relative movement between the grippers in the direction to open the jaws brings the abutment surfaces into engagement with one another to prevent further relative movement between the grippers in that direction, the locking means being releasable to free the abutment member so as to permit further relative movement between the grippers in said direction.

4,839,962

HARNESS-MAKING MACHINE HAVING IMPROVED CABLE GUIDE

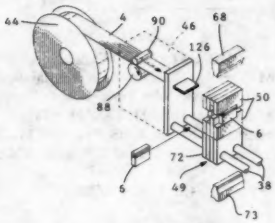
Alden O. Long, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 7, 1988, Ser. No. 268,113
Int. Cl.[4] H01R 43/00
U.S. Cl. 29—749 **13 Claims**

1. A machine for installing a connector on a ribbon cable, the machine comprising a connector installing station having in-

stalling means therein for installing the connector on the ribbon cable, a connector positioning means adjacent the installing station for locating the connector relative to the installing means, and a cable dispensing unit proximate to the installing station for dispensing cable from a cable source to the installing station, the machine being characterized in that:

a cable guide is provided on the dispensing unit, the cable guide extending cantilever fashion from the dispensing unit towards the installing station, the guide having a free end which is spaced from the dispensing unit,



means for moving the cable guide between a retracted position and a forward position, the free end of the cable guide extending substantially through the connector positioning means and being adjacent to the installing station when the cable guide is in its forward position, the cable guide being retracted from the installing station when the cable guide is in its retracted position whereby,

a connector can be placed in the connector positioning means when the dispensing unit is in its retracted position, and upon movement of the cable guide to its forward position.

4,839,963

SLIDER HANDLING APPARATUS

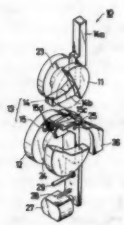
Hideki Akiyama, and Toyoo Morita, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,636

Claims priority, application Japan, Aug. 7, 1987, 62-121275[U]

Int. Cl.[4] A41H *37/06*; B21D *53/54*

U.S. Cl. 29—766 **3 Claims**



1. A slider handling apparatus which comprises:

(i) a pressure roller having a peripheral groove and vertically movable toward and away from a path of travel of a slide fastener chain carrying sliders thereon;

(ii) a drive roller having a peripheral groove and engageable with said pressure roller across the fastener chain; and

(iii) a slider arresting means comprising

(iii-1) an upper stopper received in the peripheral groove in said pressure roller and vertically movable with said pressure roller; and

(iii-2) a lower stopper received in the peripheral groove said driver roller and pivotally connected to a bracket member to move into and out of the path of the fastener chain; said upper and lower stoppers cooperating in arresting sliders one at a time at a position in advance of a nip of said pressure and drive rollers.

4,839,964

FIXING STRUCTURE OF BLADE FORCE UP SPRING FOR CLOTHES SHAVER AND ELECTRIC SHAVER

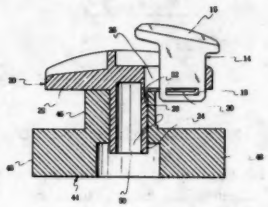
Hiromi Uchiyama, and Tsuyoshi Nakano, both of Matsumoto, Japan, assignors to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan

Filed Sep. 15, 1987, Ser. No. 96,878

Claims priority, application Japan, Jun. 27, 1987, 62-099105[U]

Int. Cl.[4] B26B *19/14*

U.S. Cl. 30—43.6 **5 Claims**



1. A rotary electric shaver for whiskers or clothing pills, comprising an outer blade in the form of a mesh, inner blades each having a cutting section at an extremity thereof, a base for supporting the inner blades with the cutting sections thereof adjacent the outer blade, the base having an upper face facing the interior of the outer blade and a lower face, the base including a shaft projecting from the lower face thereof, a spring positioned on the lower face of the base for holding the inner blades upright in an orientation substantially vertical to the lower face with the cutting sections thereof adjacent the outer blade and for biasing the inner blades toward the outer blade, the spring having a central opening through which the base shaft projects, and a fan comprising a hollow shaft and blades projecting radially therefrom, the fan shaft being received on the base shaft with an axial extremity of the fan shaft pressing portions of the spring bordering the opening in the spring against the lower face of the base.

4,839,965

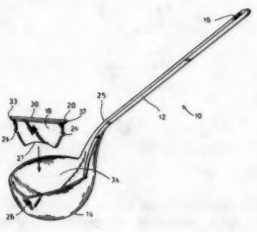
SKIMMER/SEPARATION LADLE

Mark W. Levie, New York, N.Y., assignor to LK Mfg., West Babylon, N.Y.

Continuation of Ser. No. 914,866, Oct. 3, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 176,858

Int. Cl.[4] A47J *43/28*

U.S. Cl. 30—324 **10 Claims**



1. In a skimmer/separator ladle comprising:

a handle;

a bowl having a spout section at one end thereof and a container section at the other end thereof, the improvement consisting of:

a separator gate removably mounted in said bowl between said spout and said container section and coupling means for removably mounting said gate on said bowl, said gate defining a passage with the bottom of said bowl for liquids from the container section to said spout section, said bowl having at least one track and said gate is received therein, each track being semicircular, the gate including semicircular sides that mate with each of the semicircular tracks.

4,839,966

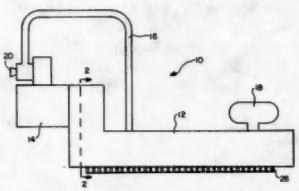
HAND-CARRIED TOOL FOR CUTTING PLASTER-LIKE MATERIAL

Benjamin Krouzkevitch, 70 Shelford Ave., San Carlos, Calif. 94070, and Alexander Litvinenko, 1974 Middle Two Rock Rd., Petaluma, Calif. 94952

Continuation of Ser. No. 934,006, Nov. 24, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,603

Int. Cl.[4] B27C *1/10*

U.S. Cl. 30—475 **9 Claims**



1. A hand-carried tool for cutting plasterlike material to produce a smoothed surface, comprising

a casing,

one or more elongated cutting cylinders each attached to said casing rotatably around an axis,

a compressed air operable motor, and

power communicating means serving to communicate motion of said motor to said elongated cutting cylinders,

each of said cutting cylinders having cutting sections and grooves alternately formed sequentially and longitudinally therealong, mutually adjacent ones of said cutting sections being separated by one of said grooves, said grooves being formed completely around said cylinders circumferentially, each cutting section having two or more edge pieces protruding radially and spaced evenly around said axis, each edge piece having a cutting edge parallel to said axis, the distance between one of said cutting edges and the opposite one of said edge pieces to said one of said cutting edges being at least 0.7 cm.

4,839,967

SURVEYING METHOD ALLOWING GREATER FREEDOM IN POSITIONING THE SURVEYING INSTRUMENTS

Chen Huei-Chin, 3Fl., No. 10-2, Lane 433, Chilin Rd., Taipei, Taiwan

Filed Dec. 28, 1987, Ser. No. 137,925

Int. Cl.[4] G01B *11/27*

U.S. Cl. 33—228 **1 Claim**

1. A method for surveying a straight line between a first point and a second point comprising the steps of:

locating a surveying instrument having a telescope at the second point;

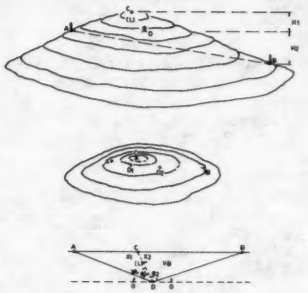
locating a compass at a third point separated by a measured distance (L) from said second point;

determining the bearing angle from said third point to said first point by said compass;

aligning the longitudinal axis of said telescope at said bearing angle;

measuring the angle (V) between the longitudinal axis of said telescope and a straight line between said second point and said third point;

measuring the angle (θ_1) between a straight line between said second point and said first point and a straight line between said second point and said third point;



defining a rotated reference line by rotating the longitudinal axis of said telescope 90° in a direction toward said first point, whereby said rotated reference line and said straight line between said second point and said third point form an angle θ_3 equal to $90° - V$; and

calculating the distance (S) between said first point and said second point using said values for L, θ_1 and θ_3.

4,839,968

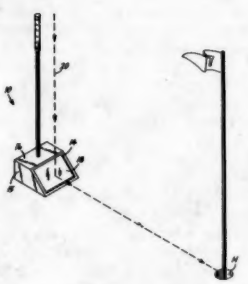
GOLF GREEN VIEWING APPARATUS

Hubert E. Logsdon, 501 E. Market St., Salem, Ind. 47167

Filed Jan. 19, 1988, Ser. No. 145,267

Int. Cl.[4] G01B *9/00*

U.S. Cl. 33—286 **1 Claim**



1. A golf green reading apparatus for enabling visual observation of golf green slope and obstruction between a position on said green remote from objective hole and said hole comprising,

a housing means for support of a reflective observing surface, said housing means including a bottom support surface, a forward surface, and a top surface; and

a handle means orthogonally secured to said housing means for transport of said housing means; and

wherein an included angle between said bottom support surface and said forward surface is an acute angle of forty-five degrees; and

wherein said housing means includes sides; said sides being of trapezoidal configuration; and

wherein said forward surface has a recess formed therein

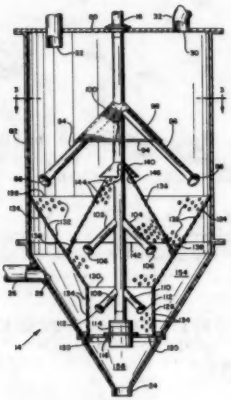
wherein said recess and said reflective observing surface are of complementary shape; and
wherein said forward surface forms a rectangular framework about said observing surface; and
wherein said handle includes an elongate shaft with a handle core secured in an upward terminal end thereof with a non-slip handle surface secured about said core; and
wherein said support surface is planar for positioning on said green and of greater surface area than said top surface to impart stability to said apparatus.

4,839,969

DRYING METHOD AND APPARATUS

Granville J. Hahn, Big Spring, Tex., assignor to Permian Research Corporation, Big Spring, Tex.

Filed Feb. 26, 1988, Ser. No. 160,521
Int. Cl.[4] F26B *17/12*
U.S. Cl. 34—169 **10 Claims**



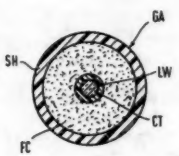
1. A drier for particulate matter, said drier comprising:
An enclosed vessel having an upper section with a vertically oriented, substantially cylindrical sidewall, and a coaxially aligned lower section with a downwardly and inwardly tapered frustoconical sidewall, the bottom edge of said upper section being substantially coextensive with the top edge of said lower section;
A rotatable shaft coaxially disposed within said vessel and extending substantially the entire interior length of said vessel;
Means for rotating said shaft within said vessel;
A plurality of axially spaced arrays of circumferentially spaced, radially extending, downwardly inclined stirring arms connected to said shaft in fixed relation to said shaft and in substantially fixed relation to each other;
Inlet means near the top of said vessel for introducing particulate matter to be dried into said vessel;
Outlet means at the bottom of said vessel for discharging dried particulate matter from said vessel;
Means for introducing a heated gas into the lower section of said vessel; and
At least two perforated substantially frustoconical separator means coaxially disposed within said vessel in fixed relation to each other and to the sidewalls of said vessel: said first separator means tapering inwardly in the downward direction and having a top edge substantially coextensive with the sidewall of said vessel and a bottom edge terminating near the bottom of said vessel, said first separator means comprising a first inwardly and upwardly facing surface and a second downwardly and outwardly facing surface, said second surface further cooperating with the sidewall of said vessel to define an annular plenum within the lower section of said vessel, said plenum being adapted to receive said heated gas introduced into the lower section of said vessel and to distribute said heated gas upwardly through said vessel, the perforations in said first separator means being adapted to permit the passage of heated gas upwardly therethrough and not being substantially larger than the average particle size of said particulate matter; said second separator means being inverted relative to said first separator means and having a top edge closely adjacent to but spaced apart from said shaft, and a bottom edge disposed inwardly of and below the top edge of said first separator means but spaced sufficiently above the interiorly facing surface of said first separator means to permit the passage of particulate matter therebetween, at least some of the perforations in said second separator means being sufficiently large to permit the passage of particulate matter therethrough.

4,839,970

FILLING COMPOUND FOR LIGHT WAVEGUIDE LEADS AND/OR LIGHT WAVEGUIDE CABLES

Werner Goetze, Berlin; Ernst Mayr, Starnberg; Ulrich Oestreich, and Helmut Saller, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 881,695, Jul. 3, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 94,093
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524181
Int. Cl.[4] G02B *6/44*; H02G *15/00*
U.S. Cl. 350—96.23 **20 Claims**



1. A light waveguide cable containing waveguide leads with a cable core filling compound between the outside surfaces of said waveguide leads and the inside surface of a casing for the cable, said core filling compound consisting essentially of:
92 to about 50 weight percent of polypropylene glycol; and
8 to about 50 weight percent of a finely distributed fumed silica, the agglomerates of the fumed silica having a size of less than 10 microns.

4,839,971

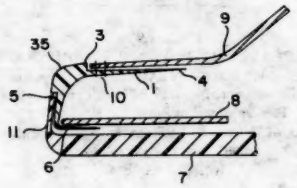
FRONT PIECE FOR SHOES

Werner Reber, Hauensteiner Strasse 22, D-6783, Dahn, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 156,804
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 8703425[U]
Int. Cl.[4] A43C *13/14*
U.S. Cl. 36—77 R **9 Claims**

1. A reinforced toe-piece for a shoe comprising:
a front piece comprised of a resilient synthetic material generally having the shape of a shoe tip, including a top portion , a flank portion and a reinforced intermediate portion formed to interconnect said top portion and said flank portion, said reinforced portion having an increased thickness relative to the top and flank portions;
said top portion and said reinforced portion having a first step forming a first recess on a surface of said top portion

for receiving a shoe upper and said top portion tapering in thickness from front to back; and



said flank portion and said reinforced portion having a second step forming a second recess on a surface of said flank portion for receiving a surrounding piece.

4,839,972

FOOTWEAR WITH PIVOTAL TOE

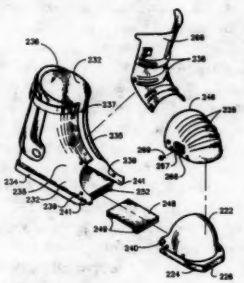
Roger N. Pack, Box 841, Edwards, Colo. 81632, and Eddress Ahmad, Box 725, Avon, Colo. 81620

Continuation-in-part of Ser. No. 835,038, Feb. 28, 1986, Pat. No. 4,667,769. This application Jul. 7, 1987, Ser. No. 70,708

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—117 **8 Claims**



1. An article of footwear adapted to receive the human foot and operative to prevent torsional rotation of the foot while permitting bending movement about the ball of the foot, comprising:

a toe portion having a first sole portion and a first relatively rigid upper shell, said first sole portion and said upper shell configured to extend around and enclose a forward part of the human foot from a forward tip receiving the toes rearwardly to a location just behind the ball of the foot, said shell having a rear edge extending over the ball of the foot;

a heel portion having a second sole portion and a second relatively rigid upper shell, said second upper shell having an access opening to permit insertion and removal of foot, said second upper shell extending around the rear of the foot and forwardly to a location proximate the ball of the foot and having a forward edge extending over the foot, said second upper shell and said second sole portion enclosing a rearward part of the foot;

hinge means interconnecting said toe portion and said heel portion for relative rotational motion about a fixed rotational axis in an axis plane substantially parallel to the plane of the first sole portion between a flat position wherein the respective first and second planes of said first and second sole portion are substantially parallel and a flexed position wherein said first and second planes are at an angle with respect to one another, said hinge means fixedly interconnecting said toe portion and said heel portion in a manner substantially prohibiting torsional movement therebetween; and

downward stop means for preventing relative angular rotational movement of said toe portion and said heel portion from said second position past said flat position in order to provide a hyperextension limit stop operative to prevent hyperextension of the foot.

4,839,973

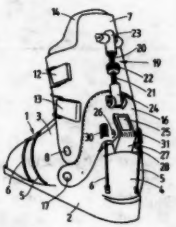
SKI BOOT

David J. Dodge, Shelburne, Vt., assignor to Lange International S.A., Switzerland

Filed Apr. 9, 1987, Ser. No. 36,268

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—121 **12 Claims**



1. A ski boot comprising a lower part (1), comprising the sole and the vamp and surrounding the heel, a one-or two-part upper (7) articulated on the lower part at two opposite points (8, 9) which coincide at least approximately with the joint of the user's foot, wherein a rear part of the upper has a rounded cutaway portion (15) between its points of articulation of sufficient depth to permit an ample backward tilting of this part, and means for releasably locking the upper in a forward upright position for skiing and for permitting the upper to be tilted backwards when released from the locked position.

4,839,974

CLOSED DECORATION FRAME

Eckhard Walter, Braunschweig, Fed. Rep. of Germany, assignor to Rahmen mit System GmbH, Braunschweig, Fed. Rep. of Germany

PCT No. PCT/EP86/00172, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/05668, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 22, 1986, Ser. No. 2,629

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 8509511[U]

Int. Cl.[4] G09F *1/12*

U.S. Cl. 40—152 **22 Claims**

1. A frame for retaining a generally planar member such as a picture, a mirror or the like, comprising:

a polygonal frame comprised of a plurality of sectional pieces, each sectional piece comprising:

an outer wall extending along a longitudinal axis and having an inner and outer surface,

a wall piece connected to the inner surface of the outer wall and projecting inwardly,

an inner wall spaced inwardly from the outer wall and connected to the wall piece,

an end face connected to the outer wall and projecting inwardly with respect to the outer wall, the end face being adapted to contact the member when the member is inserted against the sectional piece,

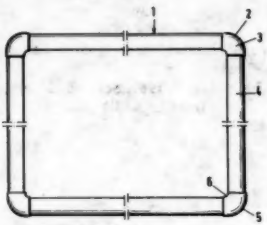
the outer wall, the wall piece, the inner wall and the end face defining a chamber; and

a plurality of corner parts for connecting the sectional pieces together, each corner part comprising:

an outer wall,

a pair of inwardly projecting stop faces connected to the outer wall and oriented so as to be substantially perpendicular to one another.

a pair of lugs, each lug extending from a respective stop face and being dimensioned so as to be receivable in the chamber of a sectional piece, whereby the sectional piece can be selectively secured to the corner part, the lugs being positioned with respect to the stop faces so that a pair of sectional pieces inserted over the lugs will be oriented substantially perpendicular to one another, each corner part further comprising a pair of inner edges disposed inwardly from the outer wall and spaced apart from one another in a lateral direction perpendicular to the longitudinal axis, the outer wall, the stop faces and the inner edges defining a free receiving space for receiving a portion of the generally planar member retained by the frame.



4,839,975

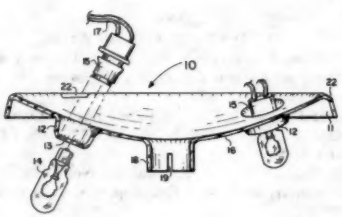
LIGHTING SYSTEM FOR CAR TOP SIGN

William A. Elmer, 917 N. Pennsylvania Ave., Winter Park, Fla. 32789

Filed Jun. 1, 1987, Ser. No. 55,993

Int. Cl.[4] G09F *21/04*

U.S. Cl. 40—592 **3 Claims**



1. A lighting fixture for a car top sign, said sign formed as a triangular truncated pyramid having three faces of a translucent material for bearing a message and a triangular top surface, comprising:

a circular reflector having a convex surface thereof for efficient reflection of light, said reflector symmetrically attached to an interior surface of said triangular top surface;

three electric lamps in which each lamp depends from said convex surface opposite each respective apex of said triangular truncated pyramid and positioned to illuminate each of the adjacent faces of said truncated pyramid;

electrical connection leads from said lamp for connection to a source of electrical power; and

each of said faces thereby receiving overlapping reflected and direct illumination from two of said lamps, the curvature of said convex surface selected to concentrate light from said lamps on said panels.

4,839,976

DISPLAY AND DISPENSING APPARATUS

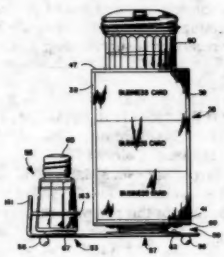
Arlene Kyler, 3445 Park Ave., Oceanside, N.Y. 11572

Continuation of Ser. No. 829,829, Feb. 14, 1986, Pat. No. 4,727,666. This application Nov. 25, 1987, Ser. No. 125,376

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] G09F *3/18*

U.S. Cl. 40—42 **16 Claims**



1. Apparatus for displaying advertising items, such as business cards, and also for containing articles, such ar food products, available for selective removal therefrom, comprising:

a substantially upright enclosure with substantially upright, substantially transparent side walls, and a top having a opening therein;

a side wall surface of said enclosure adapted to retain and exhibit said advertising items;

a receptacle accommodated in the top portion of said enclosure and extending downwardly from said opening, for holding said articles in a manner suitable for convenient removal of said articles therefrom; and

a space defined between inner surfaces of said side walls and said receptacle, said advertising items being at least partly received in said space and supported by both said receptacle and an inner surface of said side walls.

4,839,977

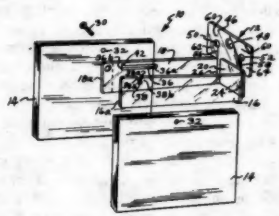
MOUNTING CLIP FOR DISPENSING SHEET-LIKE ITEMS

Richard G. Krautsack, Arlington Heights, Ill., assignor to Comark Merchandising, Inc., Elk Grove, Ill.

Filed Feb. 24, 1988, Ser. No. 159,828

Int. Cl.[4] G09F *3/20*

U.S. Cl. 40—658 **11 Claims**



1. Apparatus including a clip for displaying and dispensing a

plurality of sheet-like materials, one at a time, and at least one stack of sheet-like materials, comprising:

a plurality of sheet-like materials arranged in a stack;

a clip which includes a unitary strip of flexible material defining a pair of opposed arms and a base section intermediate the arms and having a rear surface;

fastener means for connecting the stack of sheet-like materials to both said arms so as to allow one said arm to slide relative to the other so that said base section is selectively movable from a position generally parallel to said stack of sheet-like materials to a position wherein the rear surface of said base section faces generally away from said stack of sheet-like materials; and

said clip further includes mounting means for mounting said base section to an external support means whereby said stack of sheet-like materials is supported a individual sheet-like components of the stack are separated therefrom.

4,839,978

SUPPORT DEVICE FOR THE MECHANISM OF A REVOLVER

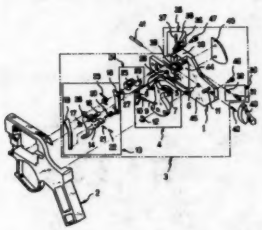
Alain Lechelle; Thierry Guidat, both of Mulhouse, and Serge Bruckert, Cernay, all of France, assignors to Matra Manurhin Defense, France

Filed Mar. 22, 1988, Ser. No. 171,716

Claims priority, application France, Mar. 23, 1987, 87 03978

Int. Cl.[4] F41C *1/00*

U.S. Cl. 42—65 **18 Claims**



1. A device for supporting a mechanism of a revolver in association with a frame of said revolver, the device being essentially constituted by a mechanism carrier plate, said plate:

firstly directly receiving various subassemblies of the mechanism, including a first subassembly associated with a hammer, a second subassembly associated with a trigger, and a third subassembly associated with a cylinder latch; and

secondly being capable of being directly mounted together with the subassemblies supported thereby on the frame of the revolver.

4,839,979

SPEAR GUN TIP ASSEMBLY AND METHOD OF USE THEREOF

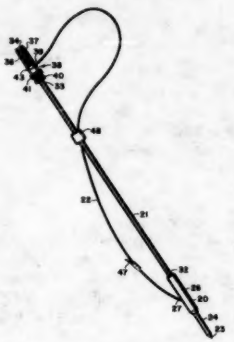
William H. Rogers, Jacksonville, Fla., assignor to Sea Search, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 072,297, Jul. 13, 1987. This application Mar. 21, 1988, Ser. No. 171,018

Int. Cl.[4] A01K *81/00*

U.S. Cl. 43—6 **20 Claims**

1. A spear tip assembly for an underwater spear gun comprising an elongated shaft member having a long axis, a forward end portion, and a rearward end portion; an elongated tip member slideably and removably attachable to said forward end portion of said shaft member; and an elongated flexible cable member with a forward end attached to said tip member and a rearward end readily affixed and removable with respect to said shaft member, a stop on and adjacent said rearward end of said cable; mounting means on said rearward end portion of said shaft member for attachment to a forward end of a spear; manually releasable clamping means on said rearward end portion of said shaft member for readily detachably securing thereto said rearward end of said flexible cable, said clamping means including a passageway through which said stop and cable may readily move, said clamping means including means



to selectively restrict the size of said passageway to prevent disconnecting movement of said stop therefrom; mounting means on said forward end portion of said shaft member for slideably and removably attaching said tip member thereto, said tip member having a forward sharpened free end and a rearward end including mating means adapted to be slideably detachable to said forward end of said shaft member.

4,839,980

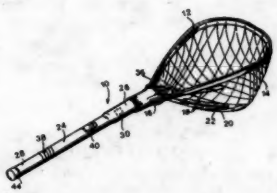
ELECTRIC FISH LANDING NET

Dana A. Hersom, Rte. 4, Emmet Still Rd., Loganville, Ga. 30249

Filed Jun. 6, 1988, Ser. No. 202,384

Int. Cl.[4] A01K *79/02, 75/02, 77/00*

U.S. Cl. 43—11 **7 Claims**



1. A hand-held landing net, capable of temporarily disabling a fish or other animal, comprising:

(a) a collecting net having electrodes located in said landing net;

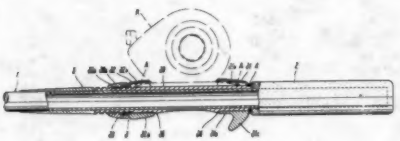
(b) a frame and handle to which said collecting net and said electrodes are attached; and

(c) means for applying an electrical potential, located in said handle, to said electrodes for applying an electrical shock to an animal that comes into simultaneous physical contact with said electrodes.

4,839,981
FISHING ROD

Toshihiko Yasui, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 24, 1988, Ser. No. 210,977
Claims priority, application Japan, May 21, 1988, 63-67251[U]
Int. Cl.[4] A01K 87/00, 87/06
U.S. Cl. 43—18.1 3 Claims



1. A fishing rod comprising:

a gently tapered conical rod body including a tail end portion and a tip end portion respectively located at opposite ends of said rod body;

a rear grip provided on said tail end portion;

a fishing reel fixture mounted on said rod body at a position in front of said grip, said reel fixture comprising (i) a cylindrical base having an inner diameter adapted to receive said rod body therein and comprising a screw thread at an outer periphery of a lengthwise front portion thereof, (ii) a fixed holder fixed to a lengthwise rear portion of said cylindrical base, (iii) a movable pusher supported on said cylindrical base to be movable axially thereof, and (iv) a threaded ring threadably engaged with said screw thread;

a bend-correcting means comprising a cylindrical member integral with said rod body and positioned in front of said reel fixture, for shifting in a direction toward said tip end portion, the position at which said rod body bends when subjected to a load from a hooked fish, said cylindrical member having an outer peripheral surface comprising means for facilitating holding thereof by an angler's hand; and

a front grip mounted on said rod body between said reel fixture and said cylindrical member, said front grip being formed of a softer material than that forming said reel fixture and said cylindrical member,

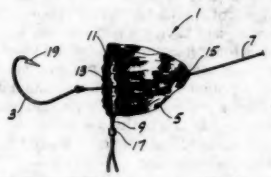
wherein said cylindrical member and said rod body are formed of prepreg comprising high strength fiber impregnated with synthetic resin, opposite surfaces of said cylindrical member and said front grip being in contact with each other, opposite surfaces of said front grip and said reel fixture being in contact with each other, an outer diameter of said cylindrical member at a rear end thereof being substantially equal to an outer diameter of said front grip at a front end thereof, an outer diameter of said front grip at a rear end thereof being substantially equal to an outer diameter of said cylindrical base of said reel fixture.

4,839,982
FISHING LURE

Robert G. Wood, 384 Palermo Dr., Ballwin, Mo. 63011

Filed May 13, 1988, Ser. No. 193,821
Int. Cl.[4] A01K 85/00, 97/04
U.S. Cl. 43—41 5 Claims

1. A fishing lure comprising a fishhook with a pointed end, a bag having sidewalls formed of open-mesh material closed at one end and open at the other end and having means for drawing the open end closed thereby enclosing the fishhook within the bag, and a leader attached to the fishhook and extending through a sidewall of the bag, such that the bag is slideably mounted solely on the leader, whereby bait may be placed on the fishhook in the bag or in the bag without being placed on the fishhook and the bag then closed by said means, the bait being readily visually and/or olfactorily attractive to fish by reason of the open-mesh characteristic of the bag, and the

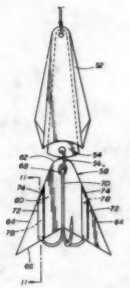


pointed end of the fishhook readily penetrating the bag by reason of its open-mesh characteristics for hooking a fish.

4,839,983
FISHING LURE APPARATUS WITH FISH ATTRACTANT

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Filed Sep. 28, 1987, Ser. No. 101,600
Int. Cl.[4] A01K 85/01
U.S. Cl. 43—42.06 25 Claims



1. A fishing lure member comprising:

a web-like body member having a pair of opposite broad surfaces bounded by relatively thin peripheral edges, a leading end adapted for attachment to a linking ring or the like, and a trailing end distal the leading end;

means on said body member defining two pockets extending along at least one of said broad surfaces and each having an opening;

said pockets are elongated in the leading-trailing direction, each of said openings being disposed at one end of the respective pocket;

respective fish attractants removably disposed in said pockets;

said lure member is at least partially translucent in an area adjacent one of said pockets;

one of said fish attractants comprising a self-contained chemiluminescent cartridge light source disposed adjacent said translucent area;

said chemiluminescent cartridge light source is flexible and defines two inner chambers, separated by wall means frangible upon flexure of said light source, each of said chambers containing a respective substance, said two substances being capable of producing light when brought into contact with each other; and

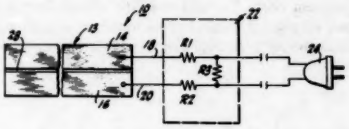
an olfactory fish attractant removably disposed in the other of said pockets.

4,839,984

INSECT GUARD SYSTEM AND METHOD OF USE

Anne L. Saunders, and John G. Fields, both of 3169 Murietta's Roost, Dorrington, Calif. 95223

Filed Nov. 12, 1987, Ser. No. 119,787
Int. Cl.[4] A01M 1/22
U.S. Cl. 43—112 14 Claims



1. A system for training and repelling crawling insects, comprising: an elongated, flexible, electrically insulating substrate; a pair of elongated spaced conductors mounted on said substrate, said conductors being highly reflective and slippery; and power assembly means connected to said conductors for establishing a voltage differential providing a short-circuit current of about fifty microamps to about one microamp across said conductors, whereby crawling insects are repelled from crossing the spaced conductors by a combination of reflected images, slipperiness, and shock caused by bridging the voltage differential.

4,839,985

NEST EXTERMINATION KIT

Irwin M. Barry, Exchange Lots, Couva, Trinidad and Tobago

Filed Mar. 18, 1988, Ser. No. 170,009
Int. Cl.[4] A01M 1/20
U.S. Cl. 43—132.1 3 Claims

1. A new and improved nest exterminating kit comprising,

a nest exterminating gun including a tubular barred formed with an open first end of a first diameter and a second end defining a smaller second opening, and

a ram means reciprocatably mounted within said tubular barrel and formed with a forward second portion and a remote first portion extending outwardly through said second end of said tubular barrel through said second opening, and

said ram means formed with a ram grasping and shock dampening means at the first portion and a piston at the remote second portions, and

a spring means captured between said piston and said second end of the tubular barrel for providing motive power to said pistion, and

said barred accommodating a liquid containing projectile whereupon compressing said spring means aganist the second end and releasing it, said projectile will be forcibly directed from said tubular barred, and

wherein said barrel is formed with a forward sighting means, and

wherein said barrel is formed with a trigger means operative with a release link to cooperate with a series of lower ratchet teeth integrally formed on said ram means to maintain said ram means in an extended position compressing said spring means, said trigger means operative to disengage said relase link from said lower ratchet teeth to release said ram means and direct said projectile from said barrel, and

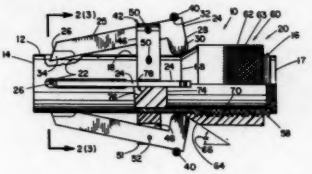
wherein the means for compressing said spring includes an "L" shaped pawl pivotally mounted adjacent to said second end and cooperating with a series of upper ratchet teeth formed on an upper surface of said ram means opposed from the surface supporting said lower ratchet teeth to retract said ram means upon pivotal engagement of said pawl with said upper ratchet teeth.

4,839,986

GRAFTING APPARATUS

Debs E. Grantham, 4603 County Rd. 63, Rosharon, Tex. 77583

Filed Mar. 18, 1988, Ser. No. 169,626
Int. Cl.[4] A01G 1/00
U.S. Cl. 47—6 26 Claims



1. A hand-held tool for making grafting-flap cuts in the bark of a limb of a selected woody plant, comprising

body means having axially aligned tubular ends including a first open end for accommodating coaxial insertion of the limb therein, and including a handle portion adjacent the end opposite said first open end, the tubular portion adjacent said first open end including a plurality of elongated slots longitudinally disposed therein and circumferentially equally spaced in parallel relation therearound, one end of said slots terminating adjacent said open end,

stop means cooperating with said body means for engaging the end of the inserted limb and limiting the depth of insertion thereof to a preselected depth,

a plurality of elongated knife members having first and second ends interconnected by an elongated central section, said first end having a sharp knife edge disposed on a lower longitudinal edge thereof and communicating with said first end, said longitudinal axis of each of said plurality of knife members registering with the longitudinal axis of one of said plurality of circumferentially spaced slots in said tubular body member for orienting said first end and said knife edge and a portion of said knife central section in registration with each of said parallel slots,

support means cooperating with said body means for supporting each of said knife members in a radially spaced relation to said body means in longitudinal axial registration with one of said plurality of slots, said support means mounting each of said knife members about a pivot point transversely disposed in said central section for permitting limited rotational movement of said knife member thereabout,

biasing means cooperating with said second ends of said plurality of knife members for biasing said second ends radially inwardly toward said body means and retracting said sharp knife edges upwardly into said slots, and

force exerting means cooperating with said handle end of said body means and selectively movable longitudinally in

relation thereto for engaging said second ends of said plurality of knife members and applying forces thereagainst opposing said bias means for pivoting each of said knife members upwardly about said pivot point for rotating said first end and said sharp knife edges thereof downwardly through said elongated slots in said tubular body means for engaging the limb inserted coaxially into said body means in a predetermined circumferentially spaced relationship, said force exerting means being further adjustable to apply sufficient forces on said knife member second ends for forcing said sharp knife edges into the limb to a pre-selected depth,

wherein when said body means handle end is manipulated for coaxially withdrawing said body means from the end of the limb, said plurality of sharp knife edges will cut a plurality of parallel grafting-flap cuts in said limb.

4,839,987

PROP SUPPORT FOR PLANTS GROWN IN BOXES

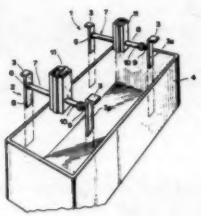
Paul-André Cosandier, 10, ch. de Tolochenaz 1110 Morges, Vaud, Switzerland

Filed Aug. 25, 1987, Ser. No. 89,090

Claims priority, application Switzerland, Aug. 29, 1986, 3465/86

Int. Cl.[4] A01G *9/12*

U.S. Cl. 47—70 **7 Claims**



1. A plant support comprising more than one assembly supporting a propping means within a container for growing and supporting plants comprising two assemblies for supporting said propping means, each assembly comprising two clamping elements, each of which is provided with a contact surface which engages a corresponding surface of an inner wall of the container, an extensible bar having a pair of ends, the extensible bar being mounted between said two clamping elements and at least one connection piece slidingly disposed on said extensible bar and provided with means for attaching at least one part of said propping means, each of said two clamping elements further including on a side facing the other clamping element a socket for receiving one end of said extensible bar, each of said ends being freely located in said sockets, said sockets being bounded by a circular rib of triangular cross-section and having conical inside walls.

4,839,988

PANIC EXIT DEVICE

John E. Betts, Garden Grove, and George Toledo, San Diego, both of Calif., assignors to Thomas Industries Inc., Louisville, Ky.

Filed Apr. 6, 1988, Ser. No. 172,642

Int. Cl.[4] E05B *65/10*

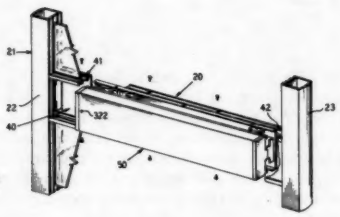
U.S. Cl. 49—141 **17 Claims**

1. In combination, a door with a panic actuator apparatus for unlatching said door mounted in and normally maintained in latched engagement with a door frame, said door including a pair of separate stiles along opposite edges and latch actuating means movable for retracting latch means which is normally providing said latched engagement between the door and the door frame, said apparatus comprising:

housing means for said panic actuator comprising a rail of said door extending between and connected to said stiles at opposite ends between opposite faces of said door, said housing including an enlarged opening on one face of said door;

a panic bar mounted in said enlarged opening for relative movement on said door in response to external pressure applied at any point against an outer face of said bar;

means supporting said bar from said housing for linear movement normal to said one face of said door including a pair of pivotal control arms mounted at a first end for rotation about a vertical axis fixed relative to said housing



and slidingly engageable with said panic bar at an opposite end;

means interconnecting said bar and said latch actuating means for unlatching said latch means in response to said movement of said bar on said door; and

said interconnecting means including a first lever pivotally mounted about a vertical axis and engageable by one of said control arms and a second lever pivotally mounted about a horizontal axis and engageable by said first lever, said second lever having an end slidingly engageable with said latch actuating means for unlatching said latch means.

4,839,989

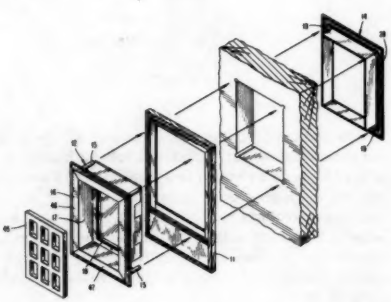
DOOR LIGHT

Dale K. McConnell, 370 Howard Ave., Holland, Mich. 49424

Filed Mar. 31, 1988, Ser. No. 175,944

Int. Cl.[4] E06B *7/28*

U.S. Cl. 49—171 **20 Claims**



1. A prefabricated door light unit for use in an opening formed in a door, said door light unit comprising:

(a) ringlike frame means adapted to be fixedly mounted in said door opening and defining therein a window opening;

(b) door means mounted on said frame means for covering said window opening;

(c) said frame means including inner and outer ringlike frame units which mount in said door opening from respective inner and outer sides of the door opening;

(d) said inner and outer frame units having a slidable telescopic connection therebetween when mounted within said door opening;

(e) said outer frame unit comprising an integral, one-piece, ringlike, performed outer frame having a ringlike peripheral flange wall adapted for engagement with the outer surface of the door in surrounding relationship to the door opening;

(f) said outer frame also including a tubular support wall structure integrally fixed to said peripheral flange wall and projecting substantially transversely therefrom into said door opening;

(g) said outer frame tubular wall structure defining an outer peripheral support surface thereon and defining said window opening therein;

(h) said outer frame having a substantially S-shaped cross section including inner and outer approximately parallel walls which are integral with and project in opposite directions from the opposite ends of an intermediate wall;

(i) said outer wall defining said peripheral flange wall and said intermediate wall defining said tubular support wall structure;

(j) said intermediate wall defining said outer support surface on the outer periphery thereof with said latter surface extending substantially perpendicular to a vertical plane of the door opening;

(k) said intermediate wall defining thereon an inner peripheral surface which, at least along the bottom of said outer frame, slopes downwardly as it projects from the inner wall to said outer wall to permit drainage of water therefrom exteriorly of the door;

(l) said inner frame unit comprising a rectangular ringlike frame having a peripheral flange wall which is positionable adjacent and engageable with the inner surface of the door in surrounding relationship to the door opening;

(m) said inner frame unit also defining transverse suppour walls which are fixed to and project transversely from said peripheral flange wall into said door opening;

(n) said transverse walls of the inner frame unit defining thereon an inner support surface whereby said transverse walls project into said door opening into the region between the edge of said door opening and said tubular wall structure so that the inner and outer frame units can be slidably moved toward one another until the respective peripheral flange walls thereof respectively engage the inner and outer faces of the door;

(o) said frame means including fastener means extending between said inner and outer frame units for fixedly connecting same together;

(p) said outer frame tubular support wall structure including a peripheral extension section extending away from said S-shaped cross section in a direction toward the inner frame unit;

(q) said peripheral extension section of the outer frame tubular support wall structure defining said window opening;

(r) said door means being hingedly connected to swing between open and closed positions with respect to said window opening adjacent one side of the peripheral extension section; and

(s) fastening means for securing the door means in a closed position across said window opening;

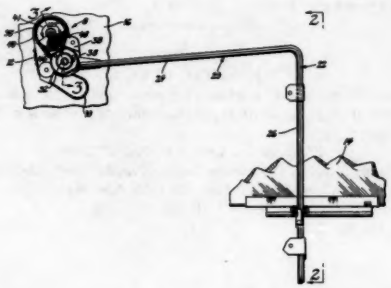
(t) said peripheral extension section being disposed within the interior frame when the door light unit is mounted in said door opening.

4,839,990

APPARATUS AND METHOD OF A POWER SPRING COUNTERBALANCE FOR TAPE DRIVE WINDOW REGULATORS

Michael K. Lam, Southfield; Bohdan Kazewych, Union Lake, and Edmond R. Gionet, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1986, Ser. No. 933,202
Int. Cl.[4] E05F *11/48*
U.S. Cl. 49—352 **9 Claims**



1. A vehicle tape drive window regulator, said regulator comprising in combination:

a drive tape connected with said window;

guide means providing a fixed path for said tape;

a winder gear drivably engaged with said tape for moving said tape in first and second directions; and

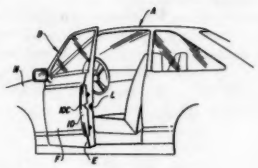
a counterbalance gear drivably engaged with said tape, and said counterbalance gear being in mesh with said winder gear whereby energy is stored from said tape when said tape is moving in said first direction and energy is released to said tape when said tape is moving in said second direction.

4,839,991

RETRACTABLE GUARD FOR MOTOR VEHICLE DOOR

Peter M. Rathgeb, 5721 SW. 162nd Ave., Fort Lauderdale, Fla. 33331

Filed May 4, 1988, Ser. No. 190,140
Int. Cl.[4] B60J *5/00*
U.S. Cl. 49—462 **16 Claims**



1. A retractable guard mechanism for a motor vehicle door having a front hinge, a rear edge, and a latch, said mechanism comprising:

a. means for projecting from the front hinge of the door;

b. first means for clamping to the projecting means;

c. a cable attached at one end to the first clamping means;

d. second means for clamping to an opposite end of the cable;

e. an arm attached at one end to the second clamping means;

f. a rod fixed to an opposite end of the arm;

g. lever means, mounted at one end to both ends of the rod,

for turning with the rod as the rod is rotated about its longitudinal axis;

h. first spring means, coiled around both ends of the rod, for forcing the lever means to an extended position;

i. plate means, mounted as its rear side to an opposite end of the lever means, for pivoting around said opposite end of the lever means beyond the rear edge of the door;

j. an elastic bumper guard secured to a front side of the pivoting plate means; and

k. second spring means, attached to the rear side of the pivoting plate means, for rotating the pivoting plate means with the elastic bumper guard secured thereto to an extended position.

4,839,992

POLISHING DEVICE

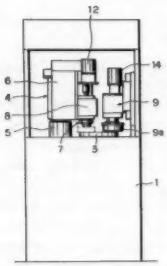
Takeo Ishida, Aichi; Hiroshi Hagiwara, and Ichizo Kakumu, both of Nagoya, all of Japan, assignors to Sintobrator, Ltd., Nagoya, Japan

Filed Apr. 4, 1988, Ser. No. 177,268

Claims priority, application Japan, Dec. 22, 1987, 62-324816; Dec. 22, 1987, 62-324817; Dec. 22, 1987, 62-194346[U]

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 D **4 Claims**



1. A polishing device comprising:

a frame;

a first rotary grindstone rotatably mounted on said frame, the upper surface of said rotary grindstone being a first grinding side;

a workpiece holding means for holding and bringing a workpiece into abutment with said first grinding side of said first rotary grindstone;

a pressure adjusting means incorporated in said workpiece holding means for adjusting the grinding pressure upon said workpiece; and

a truing dressing means for dressing said first grinding side of said first rotary grindstone, said truing dressing means having a second rotary grindstone and an angle adjust means for adjusting and fixing the angle of said second rotary grindstone with respect to said upper surface of said first rotary grindstone.

4,839,993

POLISHING MACHINE FOR FERRULE OF OPTICAL FIBER CONNECTOR

Takayuki Masuko, Tokyo; Norio Suzuki, Yokohama, and Kaoru Moriya, Yokohama, all of Japan, assignors to Fujisu Limited, Kawasaki, Japan

Filed Jan. 16, 1987, Ser. No. 3,803

Claims priority, application Japan, Jan. 28, 1986, 61-016310; Mar. 14, 1986, 61-038033; May 30, 1986, 61-081948[U]; Jul. 30, 1986, 61-179357

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—129 **4 Claims**

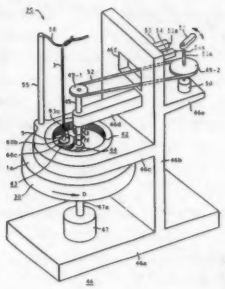
1. A polishing machine for polishing the end faces of elongated ferrules supporting coaxially aligned optical fibers to be connected in an optical fiber connector, said polishing machine comprising:

a rotating disk having a flat face:

a rubber plate on said rotating disk, said rubber plate being capable of elastic deformation under the influence of compression applied on its surface;

a thin copper polishing disk on said rubber plate, said polishing disk being capable of elastic deformation under the influence of compression applied on its surface;

means for pressing the end face of a said ferrule against the surface of said polishing disk with the longitudinal axis of the ferrule disposed generally perpendicularly to the surface of said rotating disk;



means for rotating said ferrule alternately in opposite directions within a predetermined angle around its longitudinal axis;

means for revolving said ferrule around an axis parallel to and spaced laterally from its longitudinal axis alternately in opposite directions within a predetermined angle on the surface of said polishing disk;

means for detecting that said ferrule has been rotated through a predetermined angle and outputting a detection signal; and

means for switching the rotational and revolving directions of said ferrule in response to said detection signal.

4,839,994

BELT GRINDING MACHINE

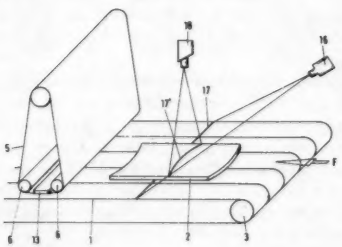
Juergen Heesemann, Bad Oeynhausen, Fed. Rep. of Germany, assignor to Karl Heesemann Maschinenfabrik GmbH & Co. KG, Bad Oeynhausen, Fed. Rep. of Germany

Filed Nov. 17, 1987, Ser. No. 121,852

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639329

Int. Cl.[4] B24B *21/00*

U.S. Cl. 51—165.72 **18 Claims**



1. A belt grinding machine comprising a pressure bar which

has a plurality of pressure shoes arranged next to one another transversely relative to the conveying direction of a workpiece to be machined, and in which each pressure shoe has assigned to it its own pressing-on device actuable as a function of workpiece parameters, a signal-processing unit means for controlling the pressing-on force of the pressing-on device based on the workpiece parameters, including the surface contour and thickness of the workpiece, and local and time data of the workpiece transport operation, a light source [for detecting workpiece parameters] that illuminates the surface of the workpiece linearly transversely relative to the conveying direction, wherein the light source is arranged in front of or behind a light incidence point in the conveying direction, and a light sensor which senses a surface region comprising a portion of the transverse direction and a portion in the conveying direction and outputs a signal to the signal-processing unit means that is used by the signal-processing unit means to determine the surface contour and thickness of the workpiece in the surface region.

4,839,995

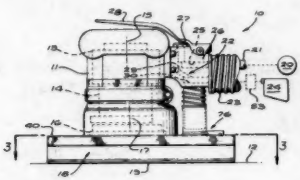
ABRADING TOOL

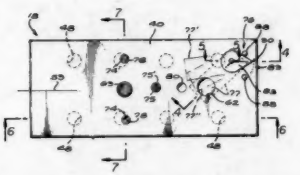
Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

Filed May 2, 1988, Ser. No. 188,961

Int. Cl.[4] B24B *23/04, 55/06*

U.S. Cl. 51—170 MT **26 Claims**





1. An abrading tool comprising:

a body to be held by a user;

a unit mounted to said body for movement relative thereto and adapted to carry a work abrading element;

a motor carried by said body and operable to move said unit relative to the body to abrade a work surface;

said unit containing a passage or passages through which a flow of air and entrained particles abraded from the work surface are drawn by suction; and

a flow control valve carried by said unit and movable with said unit and a carried abrading element relative to said body by said motor;

said valve being operable to vary the effective size of an opening through which said air and entrained particles are drawn by suction, to thereby variably restrict the flow of air and particles through said opening and through said passage or passages in said unit.

4,839,996

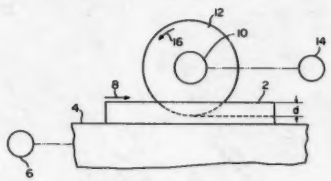
METHOD AND APPARATUS FOR MACHINING HARD, BRITTLE AND DIFFICULTLY-MACHINABLE WORKPIECES

Shinji Sekiya, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,133

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—281 R **1 Claim**



1. A method of machining a ferrite workpiece including the steps of

providing a rotating grinding wheel made of diamond abrasive grains,

rotating the grinding wheel at a peripheral velocity of 2,000 to 5,000 m/min., and

providing relative movement between the grinding wheel and the ferrite workpiece in a machining direction, said relative movement being at a feed speed of at least 50 mm/sec.

4,839,997

BRUSH SEAL MANUFACTURE

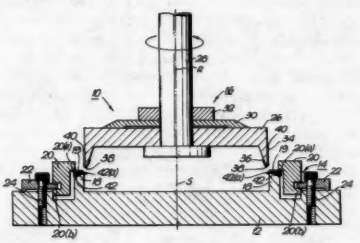
Robert B. Pritchard, Bristol, England, assignor to Rolls-Royce plc, England

Filed Oct. 16, 1987, Ser. No. 109,046

Claims priority, application United Kingdom, Oct. 24, 1986, 8625548

Int. Cl.[4] B24B *5/06*

U.S. Cl. 51—290 **3 Claims**



1. A method of machining a brush seal of the type which comprises a pair of annular sideplates having a plurality of bristle elements which are sandwiched therebetween and extend generally radially therefrom and which is provided with an axis of rotation, the method comprising holding a brush seal in a first member and removing unwanted material from the bristle elemetns of said seal with a machining device having an outer portion having a diameter equal to a finished bore diameter of said brush seal, an inner portion, and an edge, in which the machining device is rotated about an axis which is coaxial with the axis of rotation of the brush seal and is traversed in a direction along said axis such that the edge acts on an entire circumference of the bristle elements simultaneously in order to cut and remove unwanted bristle material therefrom and in

which the outer portion acts on an entire inner circumference of said cut bristles simultaneously to machine them to a predetermined size.

4,839,998

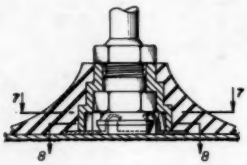
ABRASIVE APPARATUS

Aleck Block, 800 Warner Ave., Los Angeles, Calif. 90024

Continuation of Ser. No. 819,546, Jan. 16, 1986, abandoned. This application Jun. 3, 1987, Ser. No. 57,627

Int. Cl.[4] B24D *17/00*

U.S. Cl. 51—376 **22 Claims**



1. In combination for use with a drive member to polish a workpiece where the drive member has a socket, detent portions raised integrally from the socket in fixed relathionship to the socket at spaced positions around the periphery of the socket and extending in a linear direction having radial and tangential components and a centrally disposed shank with a recessed portion on the periphery of the shank,

a disc including:

an abrasive sheet having first and second spaced surfaces and having abrasive particles on one surface of the sheet, and

a fastener having a flange attached to the second surface of the sheet and having a plurality of coupling portions the coupling portions being planar and extending transversely from the flange in a linear direction having tangential and radial components for engaging the detent portions on the drive member to limit the rotary movement of the fastener when the disc engages the workpiece, the fastener having legs disposed on the coupling portions in the linear direction at an angle radially inwardly from the coupling portion the angle being greater than 90° and less than 180° relative to the associated coupling portion to extend into the recess in the shank and engage the shank at the recess in the shank, the legs being positioned relative to one another to define, with extended projections of such legs, portions of a polygon and the couplng portions being disposed relative to one another to define, within extended projections of such legs, portions of a polygon, the coupling portions and the legs being constructed to be retained by the drive member without any resilient springing of the coupling portions or the legs.

4,839,999

WALL STUD ASSEMBLY WITH FLANGE RETAINING SECTIONS

Forrest E. Clemens, Sherman Oaks, and Jack Doke, Walnut, both of Calif., assignors to Clemco Roll Forming, Inc., City of Industry, Calif.

Filed Dec. 18, 1987, Ser. No. 134,687

Int. Cl.[4] E04C *3/32*

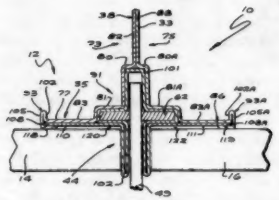
U.S. Cl. 52—36 **2 Claims**

1. A stud for use with a bracket support in forming a wall unit, comprising:

(a) a pair of unitary elongated channels arranged back-to-back to form a common flat web, each one of said channels being a mirror image of the other channel;

(b) said web extending integrally with and interconnecting two generally similar elongated shoulder portions;

(c) each one of said shoulder portions defining a stepped section for receiving and retaining the bracket support, each one of said flange retaining sections including a relatively short orthogonal interior edge which is reversely bent into a generally L-shaped elbow that defines a narrow elongated passageway with said stepped section; and



(d) said stepped section extending integrally into and interconnecting two generally similar flange retaining sections for rigidifying said shoulder portion and for further securing the bracket support into frictional engagement with the stud.

4,840,000

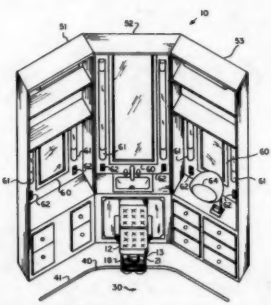
MODULAR SALON STATION

Tyrone C. Grines, 3735 Kensington St., Kansas City, Mo. 64128

Filed Jun. 10, 1988, Ser. No. 205,332

Int. Cl.[4] A47C *1/04*

U.S. Cl. 52—36 **5 Claims**



1. An apparatus for handling a salon patron, comprising;

a floor having an upper surface and a lower surface;

roller means retractably mounted to said lower surface of said floor;

means for defining a predetermined path along said upper surface of said floor;

a chair for handling said salon patron, said mobile chair being movable along said predetermined path;

means for coupling said mobile chair to said predetermined path, for guiding said chair along said path;

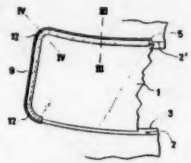
a plurality of cabinet modules attached to the upper surface of said floor; said cabinet modules disposed substantially parallel to said means for defining a predetermined path.

4,840,001

DEVICE FOR MOUNTING WINDOW PANE

Toshihide Kimisawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jan. 18, 1989, Ser. No. 298,011
Claims priority, application Japan, Jan. 30, 1988, 63-10460[U]
Int. Cl.[4] B60J *1/00*; E06B *3/58*
U.S. Cl. 52—208 2 Claims



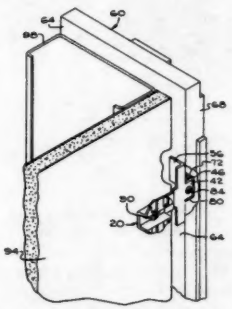
1. A device for mounting a window panel in a depression formed in a vehicle panel and enclosing an area slightly larger than the area of said window pane, comprising a plastic fastener set along the inner side surface of said depression and a counter-fastener supported by said fastener to hold the edge of said window pane, said fastener being provided with an auxiliary member provided at a position corresponding to the corner of said depression for supporting said counter-fastener.

4,840,002

SYSTEM FOR INSTALLING WOOD DOOR JAMBS AND HARDWOOD DOOR TRIM

Einar Lovgren, 3011 Linton Blvd., #203-D, Delray Beach, Fla. 33445

Filed May 14, 1987, Ser. No. 50,304
Int. Cl.[4] E06B *1/04*
U.S. Cl. 52—213 17 Claims



1. A system for installing wood door jambs and wood trim comprising, in combination:

a clip having a base portion adapted to abut a wall surface, the base portion having an aperture adapted to receive fastening structure therethrough for engaging said clip to wall structure, structure for engaging a piece of hardwood trim comprising tongue structure, said tongue structure comprising at least one tongue flange, the tongue flange being substantially parallel to the base portion and being raised from and fixed to said base portion by leg flange means, and structure for engaging a door jamb; and,

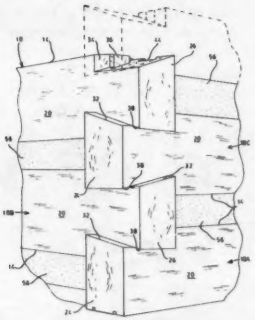
at least one piece of trim, the trim having a front face and a back face, the back face of the trim having engagement structure comprising undercut structure adapted to engage the tongue flange on said clip, whereby the trim is firmly fixed to the clip and to the wall structure without the need to drill holes through the visible front face of the trim, and the door jamb is fixed to said clips and to said wall structure.

4,840,003

CONSTRUCTION LOG AND ASSOCIATED CORNER CONSTRUCTION

Gordon H. Lucas, and Randy K. Giles, both of Jefferson County, Tenn., assignors to Hearthstone Builders, Inc., Dandridge, Tenn.

Filed Nov. 9, 1987, Ser. No. 118,554
Int. Cl.[4] E04B *1/10*
U.S. Cl. 52—233 15 Claims



1. An improved log for interlocking with other similar logs for the construction of a log structure, said improved log comprising an elongated body defining a longitudinal axis and having an upper portion and a lower portion, and first and second exterior surfaces, said body including at least a first end portion for interlocking with said other similar logs, said first end portion defining a distal end and being provided with:

an upper notch provided in said upper portion of said body for engaging said similar log, said upper notch having a first engaging surface and a second substantially vertical engaging surface, said first engaging surface defining a planar surface which is laterally inclined from a point proximate said first exterior surface of said body to a point proximate said second exterior surface of said body, said second engaging surface provided with a first dovetail tenon;

a lower notch provided in said lower portion of said body for engaging said similar log, said lower notch having a third engaging surface for engaging a first engaging surface of said similar log and a fourth substantially vertically disposed engaging surface provided with a second dovetail tenon, said third engaging surface defining a further planar surface which is longitudinally inclined from a point proximate said distal end of said body to a point displaced a selected distance from said distal end so as to closely receive said first engaging surface of said similar log; and

a substantially vertically disposed dovetail mortise defined in said second exterior surface of said body for receiving said first and second tenons of said first end portion of said similar logs.

4,840,004

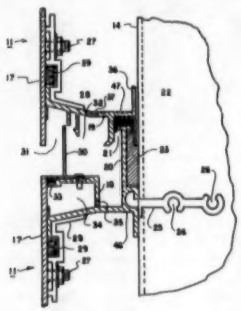
EXTERNALLY DRAINED WALL JOINT DESIGN

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Jul. 21, 1988, Ser. No. 222,551
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—235 9 Claims

1. In an exterior building panel wall assembly formed from individual wall panels secured to spaced apart wall supporting members, each said wall panel having essentially parallel top and bottom horizontal edges and two essentially parallel vertical side edges, said wall panels being joined along said horizontal edges to form horizontal wall joints and along said vertical

edges to form vertical wall joints, each said wall panel comprising an essentially flat exterior facing member and four interior perimeter extrusions including one top perimeter extrusion, one bottom perimeter extrusion, and two side perimeter extrusions, said perimeter extrusions being connected to said facing member by structural connecting means and sealed in between, a horizontal wall cavity being formed at each said horizontal wall joint between said top perimeter extrusion and said bottom perimeter extrusion across said horizontal wall joint, a vertical wall cavity being formed at each said vertical wall joint between said side perimeter extrusions across said vertical wall joint; the improvement comprising a horizontal rain screen member installed within said horizontal wall cavity separating said horizontal wall cavity into an outer horizontal cavity and an inner horizontal cavity, an upstanding male joint spline behind said inner horizontal cavity in said top perimeter



extrusion, a horizontal female joint in said bottom perimeter extrusion to cause engagement with said male joint spline, a vertical rain screen member installed within said vertical wall cavity separating said vertical wall cavity into an outer vertical cavity and an inner vertical cavity, said outer horizontal cavity and said outer vertical cavity being interconnected to form an outer cavity, said inner horizontal cavity and said inner vertical cavity being inter-connected to form an inner cavity, at least one drainage hole being provided near the bottom of said inner horizontal cavity allowing water drainage from said inner cavity to said outer cavity, a horizontal seal being provided in said horizontal female joint, a vertical seal being provided between said side perimeter extrusion and said wall supporting member, marriage seal being provided between said horizontal seal and said vertical seal, corner seals being provided at the intersecting corners of said perimeter extrusions.

4,840,005

PURLIN BRIDGING

Ronald Cochrane, Queensland, Australia, assignor to Australian Building Industries Pty. Ltd., Queensland, Australia

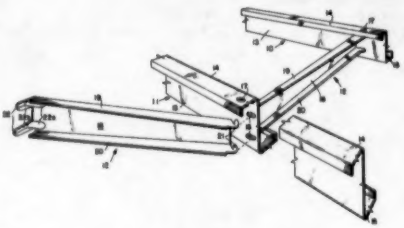
Filed Aug. 4, 1988, Ser. No. 228,032
Claims priority, application Australia, Jun. 1, 1988, 16953/88
Int. Cl.[4] E04C *2/42, 3/02*
U.S. Cl. 52—667 **5 Claims**

1. Purlin bridging of the type comprising a series of bridging members each at its ends engaging in holes in a sheet metal purlin, wherein each bridging member includes:

a channel, with a web between a pair of flanges,

lugs extending from and substantially perpendicular to the web for engagement in the purlin holes,

hooks projecting from the flanges of the channel for engagement in the purlin holes, locking the lugs of the next



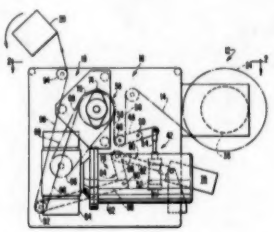
succeeding bridging member against disengagement from the purlin holes.

4,840,006

STRETCH WRAPPING MACHINE

John R. Humphrey, Naples, Fla., assignor to International Packaging Machines, Inc., Naples, Fla.

Division of Ser. No. 813,074, Dec. 24, 1985, Pat. No. 4,693,049, which is a continuation-in-part of Ser. No. 374,741, May 4, 1982, Pat. No. 4,590,746, which is a continuation-in-part of Ser. No. 307,283, Sep. 30, 1981, abandoned. This application Jun. 15, 1987, Ser. No. 62,466
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—64 **27 Claims**



1. A wrapping machine for wrapping with substantially constant tension a load placed on a rotatable turntable with a stretchable wrapping material comprising:

a prestretcher for stretching the wrapping material prior to wrapping around the load;

rotatable holding means for holding a roll of stretchable wrapping material which supplies the wrapping material to be wrapped around the load;

braking means coupled to the rotatable holding means for applying a braking force to the holding means in accordance with a brake control signal applied thereto to cause the film disposed on the roll to be restrained;

a single driven roller disposed between the roll of stretchable wrapping material and the turntable which contacts the stretchable wrapping material for applying a force to the stretchable wrapping material to cause prestretching and for changing the velocity of the stretchable wrapping material being delivered to the load to maintain substantially constant wrapping tension;

a variable speed electric motor for rotating the single driven roller to cause prestretching of the stretchable wrapping material disposed between the roll of stretchable wrapping material and the driven roller;

means for generating the brake control signal, the brake control signal being applied to the braking means to control the prestretching of the stretchable wrapping mate-

rial, the brake control signal being a function of the supply of film from the roll of stretchable wrapping material;

means for maintaining substantially constant tension on the stretchable wrapping material being wrapped around the load disposed between the driven roller and the turntable which controls the speed of the variable speed electric motor as a function of velocity sensed during wrapping of the stretchable wrapping material located between the driven roller and the turntable by a velocity sensing means; and

means for selecting the amount of prestretching.

4,840,007

PACKAGING MACHINE WITH A DRYING TURRET

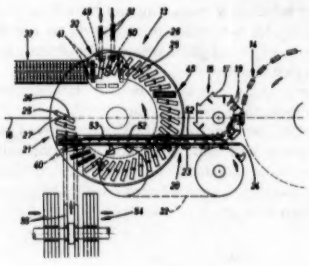
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GMBH & Co.), Verden, Fed. Rep. of Germany

Filed Dec. 31, 1987, Ser. No. 140,188

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701768

Int. Cl.[4] B65B *11/28, 51/06, 19/22*

U.S. Cl. 53—137 8 Claims



1. Packaging machine for cuboid packs having glue bonds, comprising:

a folding turret (14) and a following drying turret (13) for temporarily receiving the ready-folded packs (10) into drying pockets (25, 26);

a feed conveyor (20) for the drying turret (13);

arranged between said feed conveyor (20) and said drying turret (13), a first mouthpiece disk (42) with first mouthpiece orifices (43, 44) through which the packs (10) are moved when pushed into the drying pockets (25, 26);

means for feeding a transversely directed closing stamp (40) across an end wall (28) of the pack (10) on the entry side of each of the first mouthpiece orifices (43, 44);

arranged between the drying turret (13) and a discharge conveyor (36), a rotatable second mouthpiece disk (48) with several second mouthpiece orifices (49, 50) through which the packs (10) are moved when they are pushed out of the drying pockets (25, 26); and

means for feeding revenue stamps (41) in front of each of the second mouthpiece orifices (49, 50) and bondable to the packs (10) when laid against the end wall (28) in a U-shaped manner.

4,840,008

ROLL WRAPPING HEAD TRANSFER AND PLACEMENT APPARATUS

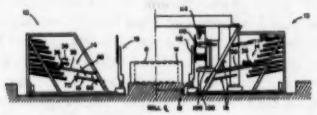
Stephen K. Hood, Hoquiam; Joseph Norkoski, Cosmopolis, and Halan P. Arnold, Aberdeen, all of Wash., assignors to Enterprises International, Inc., Hoquiam, Wash.

Division of Ser. No. 898,530, Aug. 21, 1986, Pat. No. 4,744,198.

This application Mar. 11, 1988, Ser. No. 166,682

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—137 3 Claims



1. A vacuum positioning apparatus for moving a flat circular head from a transfer position on a transfer mechanism to a placement position against the end of a paper roll at a crimper station, comprising a frame for receiving the head from said transfer mechanism and having at least a first vacuum cup and at least a second movable vacuum cup spaced from said first cup for adjusting the distance between the first and second cups to accommodate different diameter heads, and said frame being movable toward and away from said paper roll along the longitudinal axis of the roll to place a head against the paper roll.

4,840,009

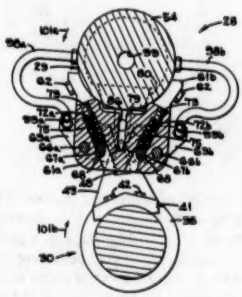
ROTARY FILM SEALING AND SEVERING HEAD FOR THERMOPLASTICS

Alan L. Rentmeester, Green Bay, and John M. Pamperin, Oneida, both of Wis., assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 22, 1988, Ser. No. 222,865

Int. Cl.[4] B65B *51/26, 51/30, 51/16*

U.S. Cl. 53—373 5 Claims



1. A heat sealing and severing device for packing articles in tubular thermoplastic, said device comprising:

an anvil assembly rotatable about a first rotational axis and having a resilient anvil surface spaced from said first rotational axis;

a film cutting assembly rotatable about a second rotational axis parallel with said first rotational axis;

a pair of hollow V-shaped clamping bars mounted on said cutting assembly with said bars being spaced apart with each of said bars being parallel with said second rotational axis and each of said bars having a narrow edge portion directed away from said first rotational axis;

a heatable knife mounted on said cutting assembly with said knife mounted between said clamping bars with said knife

parallel to said clamping bars and spaced apart from said clamping bars, said knife having a knife edge which is directed away from said second rotational axis;

means for synchronously rotating said film cutting assembly and said anvil assembly to cause said clamping bars and said knife edge to contact said resilient anvil surface as said anvil assembly and said film cutting assembly rotate into a predetermined position about said first and second second axes;

spring means for biasing said clamping bars away from said second rotational axis causing said narrow edge portion of each of said V-shaped clamping bars to contact said anvil surface before said knife edge contacts said anvil surface as said anvil surface is rotated into a position nearest to said film cutting assembly, and causing said narrow edge portion of each of said V-shaped clamping bars to remain in contact with said anvil surface after said knife edge has rotated away from said anvil surface; and

means for providing a cooling liquid to each of said hollow clamping bars.

4,840,010

DEVICE FOR ACTUATION OF SEALING JAWS OF A PACKAGING MACHINE

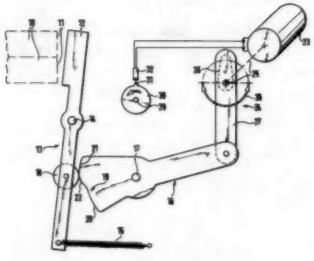
Heinz Focke, Verden, and Hans Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,534

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3636241

Int. Cl.[4] B65B *51/14*

U.S. Cl. 53—375 **6 Claims**



1. Device for control of a pressing period and for actuation of sealing jaws in conjunction with a packaging machine, particularly for sealing of folding flaps of a package, said device comprising: rotatably driven actuating means for the sealing jaws; driving means having a uniform driving period and operable to drive said actuating means; and follower means for transferring the movement of said actuating means to the sealing jaws; wherein said actuating means comprises a driven cam rocker (**16**), movable to and fro while engaging the follower means; and wherein said driving means (**23**) comprises a rotatable crank mechanism (**24**), coupled to said cam rocker (**16**), for moving said cam rocker through one oscillation, to and from, during a whole revolution of the crank mechanism (**24**), thereby temporarily to move the sealing jaws (**12**) into a sealing position once or several times during each working cycle of the packaging machine; and wherein said follwer means has a follower element (**18**) on the sealing jaws, and wherein said cam rocker (**16**) has an irregular cam track (**19**) which acts on said follower element (**18**) to actuate the sealing jaws (**12**) and thereby determine the pressing period of the sealing jaws (**12**).

4,840,011

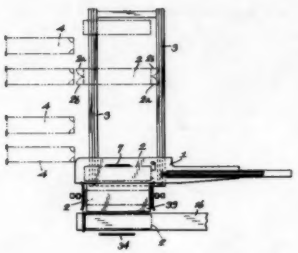
DEVICE FOR LATERALLY CUTTING CARTON CASE IN CARTON AUTOMATIC FEEDING DEVICE FOR A LIQUID FILLING MACHINE

Mitsuru Muramatsu, and Ryuichiro Tominaga, both of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1987, Ser. No. 101,521

Int. Cl.[4] B65B *7/00;* **B26D** *7/06*

U.S. Cl. 53—381 R **4 Claims**



1. A device for laterally cutting upper and lower end face edges of elongate cases comprising:

a first support having an elongate base,

a guide plate at each end of said elongate base,

a second support adjacent said first support,

an upper and a lower cutting blade located above and below each of said guide plates,

means supporting each of said cutting blades at an angle inclined relative to an adjacent guide plate,

means for selectively extending and retracting each of said cutting blades between a first position on one side of an adjacent one of said guide plates and a position on another side of that guide plate, and

means for pushing said elongate cases laterally across said first support to said second support,

whereby said end faces of said cases are moved across said guide plates and said means for extending said cutting blades may be actuated to move said cutting blades to said first position and selectively cut portions of said upper and lower end face edges of said cases.

4,840,012

ZIPPERED FILM FEED

Hugo Boeckmann, Arlington Heights, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Dec. 10, 1987, Ser. No. 130,955

Int. Cl.[4] B65B *9/20, 61/00, 61/18, 41/12*

U.S. Cl. 53—410 **8 Claims**

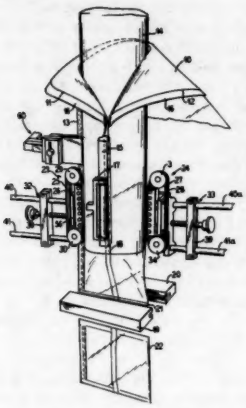
1. A method of forming and shaping a permanent assembly of a sheet of plastic film with a longitudinally extending separable fastener strip thereon into a vertically upwardly opening tubular form adapted for gravitationally receiving bag filling contents in a vertical form filling and sealing packaging operation, the steps including:

effecting cyclical dwell and intermittent downward advancing of the tube by frictionally engaging the surface of the film and pushing the film downwardly in successive cyclical increments;

cross-sealing and filling the tube above the cross-seal and filling the tube between such increments;

frictionally engaging the outer surface of the film at the

location of the fastener strip and at a location diametrically opposed therefrom;



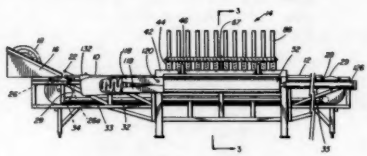
and joining the edges of the film to form a tube at a location intermediate the locations of frictional engagement.

4,840,013

MACHINE AND PROCESS FOR SINUOUSLY FOLDING A BATT OF NON-WOVEN FIBROUS MATERIAL

Guido Perrella, West Mount, Canada, assignor to Graham Fiber Glass Limited, Erin, Canada

Filed Apr. 15, 1988, Ser. No. 181,679
Claims priority, application Canada, Feb. 29, 1988, 560127
Int. Cl.[4] B65B *63/02*; B65H *45/00*
U.S. Cl. 53—429 **11 Claims**



1. A machine for sinuously folding a batt of bulky non-woven fibrous material and inserting the folded material into a container, comprising:

a series of stationary, parallel, curved folding surfaces arranged as a straight row;

a series of movable curved folding surfaces each carried by a movable mounting which allows movement of each of the latter surfaces from an initial position in which the two series of facing folding surfaces have a gap therebetween, to a final position in which each of the movable folding surfaces has passed between stationary folding surfaces so that the two types of folding surfaces are overlapped;

means for moving the movable mountings in sequence such that a batt can be pulled between the two rows of folding surfaces when the movable surfaces are in their initial position, and can be sinuously folded by sequenced movement of the movable folding surfaces from the initial to the final position;

a compaction chamber alongside the two series of folding surfaces; and

a plate provided for pushing the folded batt from the folded surfaces into the compaction chamber;

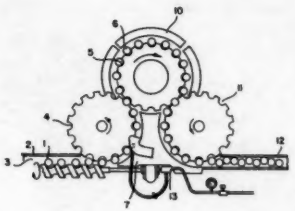
the compaction chamber having a spout at one end and a movable wall at the other end to compact the batt longitudinally and push the sinuously folded and compacted batt through the spout and into a container held against the spout.

4,840,014

PROCESS FOR PRODUCING BOTTLED BEVERAGES

Tsutomu Takehana, Sagamihara; Tetsuo Kouzai, Kouriyama; Masaaki Sagara, Kouriyama; Tamio Yaginuma, Kouriyama, and Teruji Sasaki, Kouriyama, all of Japan, assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 935,855, Nov. 28, 1986, abandoned. This application Jul. 6, 1988, Ser. No. 215,773
Claims priority, application Japan, Nov. 28, 1985, 60-266238
Int. Cl.[4] B65B *31/06*
U.S. Cl. 53—432 **3 Claims**



1. A process for producing bottled beverages comprising the following steps:

charging a liquid product for drinking into a plurality of bottles, each with an externally threaded mouth;

purging air in the head space of each bottle charged with the liquid product for drinking with a non-oxidizing gas, said non-oxidizing gas being fed as a pulsed jet in an amount of 1.5 to 10 times the volume of the head space toward the mouth through a cylindrical tube having an inside diameter corresponding to approximately 10 to 100% of the inside diameter of the mouth, the top surface of the opening of said cylindrical tube being positioned at a distance of 0.1 to 10 mm from the top surface of the mouth and being substantially parallel to the top surface of the mouth, wherein the direction of ejection of the pulsed jet of non-oxidizing gas is at an angle of 20° to 90° with respect to the top surface of the mouth; and

applying a cap onto the threaded mouth of the bottle within 0.01 to 0.05 seconds after purging.

4,840,015

METHOD OF CONTINUOUSLY PROCESSING AND PACKING ELONGATED ARTICLES SUCH AS COHERENT PAIRS OF CHOPSTICKS AND AN APPARATUS FOR CARRYING OUT THE METHOD

Gert Schultz, Hillerod, Denmark, assignor to Stormax International A/S, Herley, Denmark

PCT No. PCT/DK87/00058, § 371 Date Mar. 24, 1988, § 102(e) Date Mar. 24, 1988, PCT Pub. No. WO87/07204, PCT Pub. Date Dec. 3, 1987
PCT Filed May 21, 1987, Ser. No. 150,415
Claims priority, application Denmark, May 30, 1986, 2564/86
Int. Cl.[4] A01C *15/04*; B27C *9/00*; A47J *49/02*
U.S. Cl. 53—435 **12 Claims**

1. A method of continuously processing and packing elongated articles such as coherent pairs of chopsticks the outer shape of which being defined by two mutually parallel surfaces and two opposing surfaces inclining towards one another by the same inclination relative to a common plane of symmetry, the method comprising the steps of:

continuously advancing the articles along a track in the longitudinal direction of the articles;

centrally aligning the articles in the track during further

advancement while the articles pass by at least one processing implement by means of uniform centering rolls operating from the respective sides of said plane of symmetry of the articles, said centering rolls being biased towards the track by a uniform spring tension effected by spring means;

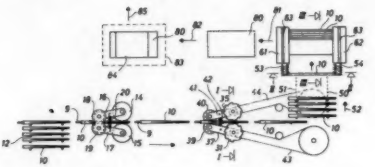
subsequently advancing the articles continuously in the transverse direction;

situating the articles in layers in a bundle of articles; and

subsequently wrapping said bundle in a sheet material.

4. An apparatus for continuously processing and packing elongated articles such as coherent paris of chopsticks the outer shape of which being defined by two mutually parallel surfaces and two opposing surfaces inclining toward each other by the same inclination relative to a common plane of symmetry, the apparatus comprising:

a longitudinal, substantially horizontal track guiding the



articles during their continuous passage through the apparatus, the plane of symmetry of said articles being situated along the vertical central plane of the track;

conveyor means advancing the articles through the track;

implements processing the articles during their passage along the track;

uniform centering rolls operating from respective sides of the track and towards the center thereof, said centering rolls being biased towards the tracks by a uniform spring tension effected by spring means for engaging the articles into alignment during the processing procedure by means of the implements;

stopping means stopping the advancement of the articles and transferring the same to transverse conveyor means;

transferring means transferring the articles from the transverse conveyor means to a bundling device;

further conveyor means carrying bundles or articles to a wrapping device wrapping said bundles in sheet material.

4,840,016

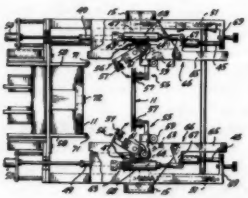
PAPER BAG FEEDER FOR BAG-FILLING OPERATIONS AND PROCESS

John E. Muller, Jr., Yakima, Wash., assignor to Pomona Service & Supply Co., Inc., Yakima, Wash.

Continuation of Ser. No. 58,593, May 20, 1987, abandoned, which is a continuation of Ser. No. 729,506, May 2, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 171,202

Int. Cl.[4] B65B *43/30, 43/18, 39/10*

U.S. Cl. 53—459 **5 Claims**



1. Supply mechanism for feeding bags from a bag pack comprising means for supporting the bag pack with the bags upright and in face-to-face contact, two front suction cup means for gripping the front face of the leading bag at horizontally spaced locations, means for moving said front suction cup means away from the bag pack while said front suction cup means are applying suction to the front face of the leading bag for separating the leading bag from the bag pack and moving such bag along a linear bag path, two rear suction cup means for gripping the rear face of the leading bag at horizontally spaced locations, means supporting said rear suction cup means, respectively, for swinging about upright axes at opposite sides of the bag path toward each other from positions at opposite sides of the bag path into horizontally spaced locations in the bag path behind the leading bag separated from the bag pack by said front suction cup means for engagement with the rear face of the leading bag, means for applying suction to said front suction cup means and to said rear suction cup means for gripping the front face and the rear face, respectively, of the leading bag separated from the bag pack, means for moving said front suction cup means and said rear suction cup means relatively apart for opening such leading bag, means mounting said two front suction cup means for swinging about upright axes at opposite sides of the bag path, respectively, and thereby withdrawing said front suction cup means away from the front face of the leading bag out of the bag path, means for gripping the opened upper end of the leading bag and moving such opened bag farther away from the bag pack past said outwardly swung front suction cup means, means for swinging said two front suction cup means about their axes toward each other into the bag path, and means for swinging said two rear suction cup means about their axes away from each other out of the bag path.

4,840,017

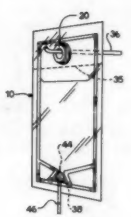
METHOD FOR FILLING COLLAPSIBLE CONTAINERS

Robert A. Miller, Crystal Lake, and Albert L. Stone, Buffalo Grove, both of Ill., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed Aug. 3, 1987, Ser. No. 80,853

Int. Cl.[4] B65B *3/04, 7/14, 51/10*

U.S. Cl. 53—468 **6 Claims**



1. The method of filling with fluid a flexible, collapsible container which comprises a pair of flexible plastic walls peripherally joined together, which method comprises:

connecting a fluid conduit to a tubular port which communicates through one of said walls to the container interior, and rupturing a sealing diaphragm that closes the bore of said tubular port; passing fluid through said conduit to fill said container;

sealing at least one of said tubular port and one plastic wall to the other plastic wall with a closed-loop seal line that completely surrounds said bore, to block flow communication between said bore and most of the container interior, whereby the contents of said container remain sealed on disengagement of said fluid conduit from the tubular port; and

cutting away at least portions of said other plastic wall situated in registry with said closed-loop seal line,

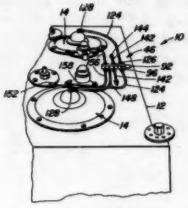
whereby the resulting open port extending through said tubular port and container can serve as a hanger port.

4,840,018

LUBRICATION DISTRIBUTION SYSTEM FOR A COTTON HARVESTER

Timothy A. Deutsch, Newton, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 28, 1988, Ser. No. 174,070
Int. Cl.[4] A01D *46/18*
U.S. Cl. 56—12.3 **12 Claims**



1. In a cotton harvester, the harvester having a plurality of cotton harvesting row units, each row unit including upright picker drum means for removing cotton from cotton plants and transmission means for driving and controlling the picker drum means, said picker drum means including first grease receiving areas adapted for receiving first preselected volumes of grease and said transmission means including cam means and gear means defining second grease receiving areas for receiving second preselected volumes of grease said first volumes being substantially greater than said second volumes, a lubrication system for automatically and simultaneously supplying grease to the first and second grease receiving areas comprising:

a source of grease on the harvester;

selectively activatable pump connected to the source of grease;

supply line means connected between the pump and the row units for supplying grease from the pump to the individual row units at approximately equal rates when the pump is activated; and

manifold means associated with each of the row units and including an input connected to the supply line means for receiving the grease from the supply line means, a first chamber in communication with the input, a plurality of first outputs opening from the first chamber, and means connecting the first outputs with the first grease receiving areas for providing a first proportion of the received grease to the first grease receiving areas, said manifold further comprising a second chamber, means for connecting the second chamber and the second grease receiving areas, and restrictor means connected between the first chamber and the second chamber for providing a second proportion of the received grease from the supply line means to the second grease receiving areas, said second proportion being substantially less than said first proportion.

4,840,019

DISC MOWER

Larry J. Pingry, Celina, Ohio, assignor to Allied Products Corporation, Chicago, Ill.

Filed Oct. 2, 1987, Ser. No. 104,821
Int. Cl.[4] A01D *34/66, 67/00*
U.S. Cl. 56—13.6 **14 Claims**

1. A rotary mowing device having a plurality of rotary cutter units mounted in substantial in-line relationship with each other, said rotary mowing device comprising:

a frame assembly having means for supporting a longitudinal cutter bar assembly in foliage-cutting relationship with respect to the ground, said cutter bar assembly having opposing end portions and an interior portion therebetween;

a mounting assembly having means for securing said frame assembly to a source of rotational power;

drive means for transmitting the rotational power to said cutter bar assembly;

said cutter bar assembly including a plurality of rotary cutter units mounted in a generally alternating manner with a plurality of spacer units, a drive shaft passing through said rotary cutter units and said spacer units, said drive shaft being in driving engagement with each of said rotary cutter units;

said cutter bar assembly having a leading edge portion defined by successive leading edge portions of said rotary cutter units and of said spacer units;

said cutter bar assembly having a trailing edge portion defined by successive trailing edge portions of said rotary cutter units and of said spacer units;

a plurality of leading edge securement means for joining the leading edge portion of each rotary cutter unit to the leading edge portion of each spacer unit adjacent thereto;

a plurality of trailing edge securement means for joining the trailing edge portion of each rotary cutter unit to the trailing edge portion of each spacer unit adjacent thereto;

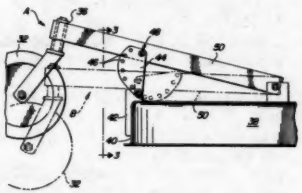
each said leading edge securement means and each said trailing edge securement means of said interior portion of the cutter bar assembly secures a rotary cutter unit sandwiched between two of said spacer units, wherein said leading edge securement means joins an ear portion of one of said spacer units and an ear portion of the other of said two spacer units to opposite transverse ends of a leading edge portion of said sandwiched rotary cutter unit, whereby said leading edge securement means is located within said leading edge portion of the sandwiched rotary cutter unit.

4,840,020

MOWER HEIGHT ADJUSTMENT MECHANISM

Ken K. Oka, St. Catharines, Canada, assignor to Deere & Company, Moline, Ill.

Filed Jun. 20, 1988, Ser. No. 208,697
Int. Cl.[4] A01D *34/74*
U.S. Cl. 56—15.2 **4 Claims**



1. Means for adjustably supporting a mower housing above the ground;

said housing including a generally horizontal deck with at least one generally horizontal deck reinforcing member;

means at the forward end of the housing connectable to a mobile vehicle, for supporting the front portion of said housing;

ground engaging means for adjustably supporting the rear portion of the housing including:

a tail wheel;

a generally fore-and-aft extending tail wheel support tube carried above the deck and projecting beyond the rear portion of said deck, the front portion of the tube attached to the deck for swinging movement about a generally horizontal pivot;

and means between the tube and deck for adjustably positioning the tube relative to the deck including:

first and second bracket means mounted on the deck and tube respectively; and

a cam-shaped adjustment member extending between the brackets:

said member having a plurality of adjustments selectively connectable with the first and second brackets.

4,840,021

CONTINUOUS MULTIFILAMENT SEWING THREAD AND PROCESS FOR MAKING SAME

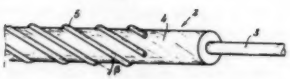
Jean Guevel, Viriat; Marc Francois, Ecully, and Guy Bontemps, Tenay, all of France, assignors to Sa Schappe, Saint Rambert en Bugey, France

Filed Feb. 22, 1988, Ser. No. 158,456

Claims priority, application France, Feb. 20, 1987, 87 02869

Int. Cl.[4] D02G *3/28, 3/04*

U.S. Cl. 57—210 **4 Claims**



1. Multifilament core sewing thread, comprising:

a fixed high-tenacity multifilament core;

a cover sheathing said core, made of staple fibers; and

a multifilament yarn wrapping said core and said cover, wherein said multifilament yarn wrapping said core and said cover has the same rate of torsion as said core and said cover.

4,840,022

PROCESS AND DEVICE FOR THE SERVICING OF WORK STATIONS OF SPINNING OR DOUBLING MACHINES BY MEANS OF A PLURALITY OF SERVICE UNITS CAPABLE OF TRAVELLING ALONGSIDE THE WORK STATIONS

Rupert Karl, and Rudolf Becker, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE86/00505, § 371 Date Nov. 9, 1987, § 102(e) Date Nov. 9, 1987, PCT Pub. No. WO87/04734, PCT Pub. Date Aug. 13, 1987

PCT Filed Dec. 9, 1986, Ser. No. 130,452

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602961

Int. Cl.[4] D01H *15/00, 9/10;* B65H *67/00;* B61J *3/00*

U.S. Cl. 57—263 **28 Claims**

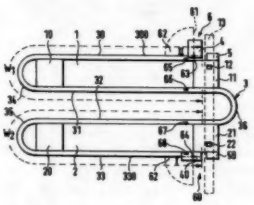
1. A process for servicing textile machinery having a plurality of work stations, including:

providing a rail system which provides access for service units travelling thereover to all of the work stations, such rail system including at least one first movable rail segment comprising a service station, which first segment may be selectively moved between an operative position in alignment with the rail system, and an inspection position displaced therefrom with said first segment temporarily replaced with a second movable rail segment, so that there are no gaps in the rail system as it existed prior to such displacement of the first movable segment; and

providing at least two independently operable service units for travelling over the rail system to service the work stations; wherein

during normal functioning of the service units for servicing the work stations, said service station is placed in its operative position, and the service units are assigned non-overlapping service areas of the rail system for efficient servicing of the work stations; and

during servicing or adjustment of one of the service units, such one service unit is moved onto the service station which is then placed in its inspection position, and the other service unit is assigned an enlarged service area for also covering the formerly assigned rail system service area of such one service unit, whereby access is obtained to such one service unit for servicing of same, while the rail system is cleared for continued servicing of all work stations by the other service unit, without having to remove such one service unit from its support on the first movable rail segment.



7. Device for servicing work stations of spinning or doubling machines having at least two service units which can travel on running rails alongside a plurality of work stations of the machine arranged next to each other, comprising curved connecting sections of rail for connecting said running rails to each other at one end of the machine so that the service units can travel from one longitudinal side of the machine to the other longitudinal side thereof; a first movable segment of running rail which can be moved crosswise to the longitudinal direction of the machine running rail with a given service unit supported thereon for bringing such service unit into an inspection position thereof; a second movable segment of running rail for replacing said first segment thereof whenever same is moved; and control means for causing the remaining service units to take over the servicing of work stations which would otherwise be serviced by said given service unit whenever such service unit is situated in its inspection position.

4,840,023

FLEXIBLE CABLE GUIDE WITH TWO-DIRECTIONAL JOINTS

Paolo Borsani, Milan, Italy, assignor to Tecno S.p.A. Mobili e Forniture per Arredamento, Milan, Italy

Filed Sep. 15, 1987, Ser. No. 97,483

Claims priority, application Italy, Sep. 15, 1986, 23021/86[U]

Int. Cl.[4] F16L *3/14*

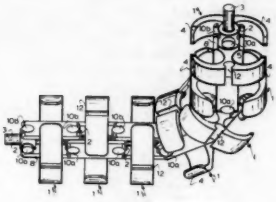
U.S. Cl. 59—78.1 **5 Claims**

1. A flexible cable guide for a plurality of electrical conductors, comprising:

a plurality of generally I-shaped elements each formed with a central web provided with a throughgoing bore adapted to receive a stiffening cable, curved flanges defining laterally open generally cylindrical spaces adapted to receive respective electrical conductors, and respective pairs of mutually parallel spaced-apart lugs projecting axially from opposite sides of said central web; and

annular articulation bodies interconnecting said elements in contiguous end-to-end articulated relationship, said articulation bodies each having two mutually perpendicular pairs of pins projecting radially, said lugs being provided with formations pivotally engageable with said pins, one

of the pairs of pins of each articulation body being pivotally engaged with a pair of lugs of a respective one of said elements and the other pair of pins of each articulation body being pivotally engaged with a pair of lugs of a respective other of said elements angularly offset from



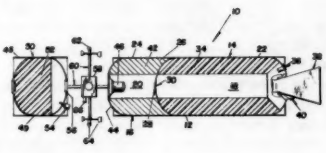
said one of said elements through 90°, whereby each of said articulation bodies and the pairs of lugs pivotally connected thereto form a Cardan-type bidirectional joint, said joints spacing the flanges of successive ones of said elements apart so that conductors can pass into an out of said guide between said elements.

4,840,024

MULTIPLE PROPELLANT SOLID ROCKET MOTOR

Allan J. McDonald, Pleasant View, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Aug. 20, 1984, Ser. No. 642,469
Int. Cl.[4] F02C 3/20
U.S. Cl. 60—39.461 **22 Claims**



1. A multiple propellant solid rocket motor comprising:

a first enclosure having a fist chamber containing a solid propellant and means for exhausting propellant combustion gases from the first enclosure to provide rocket motor thrust;

first ignition means for igniting the solid propellant;

a second enclosure associated with but insulated from the first enclosure having a second chamber containing an extinguishable solid propellant;

a third enclosure having a third chamber containing a gas generating propellant capable of generating a gas that is capable of igniting the extinguishable propellant;

second ignition means for igniting the gas generating propellant;

means for releasing generated gas within the second enclosure so as to contact, ignite, and combustibly react with the extinguishable solid propellant therein;

pressure control means intermediate the first and second enclosures for maintaining choked extinguishable propellant combustion gas flow from the second enclosure to the first enclosure during extinguishable solid propellant combustion;

removable, insulative, plug means associated with the pressure control means to seal the pressure control means until extinguishable solid propellant combustion;

means for removing the plug means in association with extinguishable solid propellant combustion;

transfer means intermediate the second and third enclosures for channeling gas generated in the third enclosure to the releasing means within the second enclosure;

gas pressure control means associated with the transfer means and intermediate the second and third enclosures for maintaining choked flow of gas from the third enclosure to the second enclosure during gas generation; and

an insulating bulkhead intermediate said first and second enclosures, said pressure control means comprises an opening in the insulated bulkhead between the first and second enclosures, the opening having an operative area maintaining choked extinguishable propellant combustion gas flow from the second enclosure to the first enclosure during extinguishable solid propellant combustion, and

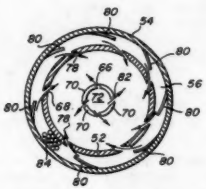
the plug means comprises an insulated diaphragm plugging the insulating bulkhead opening.

4,840,025

MULTIPLE-PROPELLANT AIR VEHICLE AND PROPULSION SYSTEM

George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 918,214, Oct. 14, 1986, abandoned.
This application Apr. 15, 1988, Ser. No. 183,471
Int. Cl.[4] C06D 6/60
U.S. Cl. 60—217 **13 Claims**



1. In a propulsion system having a rocket casing containing a combustor, propellant injectors, nozzle throat and nozzle; a fuel passageway wherein fuel is endothermically pyrolyzed, the fuel passageway being adjacent to and surrounding the combustor and nozzle throat; and means for providing fuel flow in the fuel passageway, the improvement comprising a woven silicon carbide fiber inner wall forming a combustor liner and a nozzle throat liner and a woven silicon carbide fiber outer wall spaced from the inner wall to form said fuel passageway, whereby the silicon carbide fibers are woven to conduct heat from the combustor and nozzle throat to the fuel passageway, thereby providing heat for the endothermic pyrolysis of the fuel.

4,840,026

BAND CLAMP APPARATUS

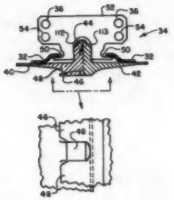
Dudley O. Nash, Cincinnati; Glenn L. Knight, Jr., Mason, and James H. Bertke, Cincinnati, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1988, Ser. No. 159,868
Int. Cl.[4] F02K 1/00
U.S. Cl. 60—271 **6 Claims**

1. A band clamp apparatus for an engine/exhaust system comprising in combination:

a first band clamp segment formed in a semi-circular shape, said first band clamp segment having a first flange at one end of said first band clamp segment and a second flange at the other end of said first band clamp segment, said first flange having a first and second bolt hole therein arranged on opposite sides of said first band clamp segment, said first flange having a pair of jackscrew holes therein arranged on opposite sides of said first band clamp segment, aligned with and spaced-above said first and second bolt

holes respectively, said second flange having a third and fourth bolt hole therein arranged on opposite sides of said first band clamp segment, said first band clamp segment including a longitudinal groove in its inner surface extending the entire length thereof, said longitudinal groove forming a pair of substantially parallel wall surfaces, and, a second band clamp segment formed in a semi-circular shape, said second band clamp segment having a third flange at one end of said second band clamp segment and a fourth flange at the other end of said second band clamp segment, said third flange having a first and second bolt hole therein arranged on opposite sides of said second band clamp segment, said third flange having a pair of jackscrew holes therein arranged on opposite sides of said second band clamp segment, aligned with and spaced-above said first and second bolt holes respectively, said fourth flange having a third and fourth bolt hole therein arranged on opposite sides of said second band clamp



segment, said second band clamp segment including a longitudinal groove in its inner surface extending the entire length thereof, said longitudinal groove forming a pair of substantially parallel wall surfaces, said engine/exhaust system providing a circumferentially mated jointed flange at their connecting point, said first and second band clamp segments positioned around said engine/exhaust system and operatively engaging said circumferentially-mounted flange, said first flange of said first band clamp segment operatively mating with said fourth flange of said second band clamp segment at the horizontal centerline of said engine/exhaust system, said first and fourth flanges being secured together by a pair of bolts, said second flange of said first band clamp segment operatively mating with said third flange of said second band clamp segment at the horizontal centerline of said engine/exhaust system, said second and third flanges being secured together by a pair of bolts.

4,840,027

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED EXHAUST EMISSION CHARACTERISTICS

Atsuo Okumura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 8, 1987, Ser. No. 105,696

Claims priority, application Japan, Oct. 13, 1986, 61-241486; Jul. 7, 1987, 62-167819

Int. Cl.[4] F01N *3/20*; F02D *41/14*

U.S. Cl. 60—274 **22 Claims**

1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, said method comprising the steps of:

calculating an air-fuel ratio correction amount in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors;

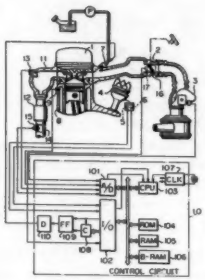
skipping a speed of changing said air-fuel ratio correction amount in accordance with the output of the downstream-side air-fuel ratio sensor by a speed skip amount immediately after the output of said downstream-side air-side ratio sensor is switched between the rich side and the lean side;

gradually decreasing the speed of changing said air-fuel ratio correction amount in accordance with the output of said downstream-side air-fuel ratio sensor ate decreasing speed after the speed of changing said air-fuel ratio correction amount is skipped; and

adjusting an actual air-fuel ratio is accordance with said air-fuel ratio correction amount;

wherein said air-fuel ratio correction amount calculating step comprises the steps of:

calculating an air-fuel ratio feedback control parameter in



accordance with the output of said downstream-side air-fuel ratio sensor; and

calculating said air-fuel ratio correction amount in accordance with the output of said upstream-side air-fuel ratio sensor and said air-fuel ratio feedback control parameter;

said skipping step skipping a speed of changing said air-fuel ratio feedback control parameter when the output of said downstream-side air-fuel ratio sensor is switched between the rich side and the lean side;

said gradually decreasing step gradually decreasing the speed of changing said air-fuel ratio feedback control parameter when the output of said downstream-side air-fuel ratio sensor indicates a lean state or a rich state.

4,840,028

PURIFIER OF DIESEL PARTICULATES IN EXHAUST GAS

Takao Kusuda, Ashiya; Masaaki Yonemura, Nara; Hisanori Shimoda, Suita; Masuo Takigawa, Ikoma, and Toshihiro Mihara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 15, 1988, Ser. No. 170,437

Claims priority, application Japan, Mar. 20, 1987, 62-66410; Mar. 20, 1987, 62-66411; Aug. 20, 1987, 62-206702

Int. Cl.[4] F01N *3/02*

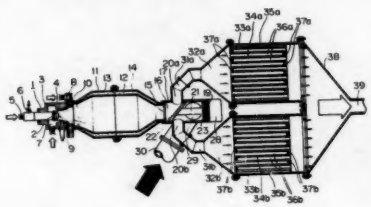
U.S. Cl. 60—303 **7 Claims**

1. An exhaust gas purifier system for connection to an exhaust pipe of a diesel engine for filtering off diesel particulates contained in exhaust gas and incinerating said particulates by means of an oil burner, comprising:

a four-way valve having a cylindrically shaped body with two gas inlets and two gas outlets, one of said inlets being connectable to the exhaust pipe of the diesel engine and the other of said inlets being connectable to a combustion chamber of the oil burner, said valve including a movable shaft disposed therein having an elliptical vane, attached to said shaft, in sliding contact with a portion of the inner surface of said body between said gas inlets, each of said gas outlets being located between said gas inlets and in

said portion of the inner surface with which said elliptical vane is in sliding contact;

two parallel filter elements made of ceramic; and



means for connecting each of said filter elements to a corresponding one of said gas outlets.

4,840,029

EXHAUST GAS CONTROL MEANS FOR ENGINE

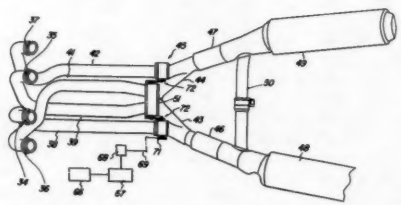
Tadashi Sakurai, and Wataru Fuchigami, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 6, 1987, Ser. No. 22,434

Claims priority, application Japan, Mar. 7, 1986, 61-48490; Mar. 7, 1986, 61-48491; Mar. 7, 1986, 61-48492

Int. Cl.[4] F02B *27/02*

U.S. Cl. 60—313 **13 Claims**



1. In an exhaust system for a vehicle powered by an internal combustion engine having a first exhaust pipe, a second exhaust pipe juxtaposed to said first exhaust pipe, a first reflective means rotatably supported upon a first shaft in said first exhaust pipe, the rotatable position of said first reflective means being effective to vary the reflective area thereof, second reflective means rotatably supported on a second shaft in said second exhaust pipe, the rotatable position of said second reflective means being effective to vary its reflective area, said shafts being positioned at different longitudinal positions along the length of said vehicle, and motion transmitting means for rotatably coupling said first and said second shafts.

4,840,030

TAIL PIPE STRUCTURE OF CONTROL TYPE MUFFLER

Tsunemi Ikeda, and Motoki Ota, both of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan

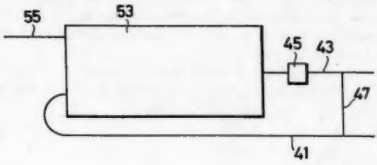
Filed Jan. 21, 1988, Ser. No. 146,422

Claims priority, application Japan, Jan. 28, 1987, 62-10975[U]

Int. Cl.[4] F01N *7/00*

U.S. Cl. 60—324 **5 Claims**

1. An internal combustion engine tail pipe structure for use with a control type muffler having first and second outlet pipes each having an upstream side for receiving exhaust gases from the muffler and a downstream side for discharge of engine exhaust gases, the second outlet pipe having a control valve inserted therein, characterized by conduit means downstream of the control valve for establishing communication between said first and second outlet pipes at a point of connection



between the upstream and downstream ends of said first outlet pipe.

4,840,031

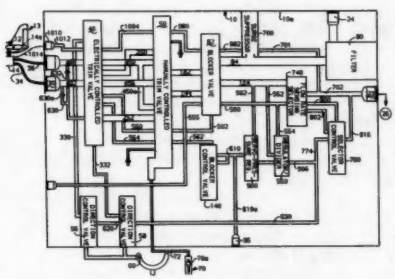
CONTROL SYSTEM FOR FLUID PRESSURE OPERATED ACTUATOR

Frank Hribar, Kirtland, Ohio, assignor to Fluid Regulators Corp., Painesville, Ohio

Filed May 5, 1987, Ser. No. 47,032

Int. Cl.[4] F16D *33/00*

U.S. Cl. 60—338 **21 Claims**



1. For a fluid pressure operated actuator having at least two pressure input ports, the application of pressure to said ports determining the direction of motion, a control system comprising:

(a) a source of pressurized fluid having a source pressure;

(b) pressure controlling means for providing a controlled fluid pressure at a pressure level that is a predetermined level below said source pressure;

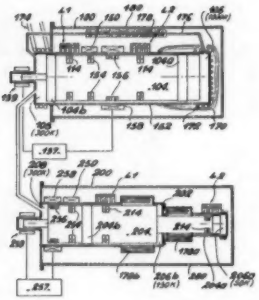
(c) direction control means operative to selectively communicate said source of pressurized fluid to one of said actuator input ports while communicating the other of said ports with a return pressure line;

(d) blocking means operative to interrupt communication of said source with said direction control means and being further operative to communicate said controlled pressure to both of said actuator input ports concurrently during actuator idle periods.

4,840,032
REFRIGERATOR, MORE PARTICULARLY WITH VUILLEUMIER CYCLE, COMPRISING PISTONS SUSPENDED BY GAS BEARINGS

Gérard Claudet, La Tronche; Bernard Dewanckel; Alain Ravex, both of Meylan, and Serge Reale, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique and Air Liquid, both of Paris, France

Filed Feb. 1, 1988, Ser. No. 150,971
Claims priority, application France, Feb. 16, 1987, 87 01926
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **15 Claims**



1. A refrigerator operating in a Vuilleumier cycle, characterized in that it uses at least one gas bearing (**104***a*, **104***b*, **201***a*, **204***b*) for the suspension of at least one piston (**4**, **104**, **201**), and comprising:

a first cylinder (**102**) having a hot end and an intermediate temperature end, and displacement piston (**104**) sliding in the first cylinder between a first and a second position to compress and expand a quantity of gas contained in the first cylinder (**102**), a conduit which includes a thermal regenerator connecting the high temperature end and the intermediate temperature end of the first cylinder;

a second cylinder (**202**) having an intermediate temperature end and a cold end, a second displacement piston (**204**) sliding in the second cylinder (**202**) between a first and a second position to compress and expand a quantity of gas contained in the second cylinder;

a duct connecting the intermediate temperature end of the first cylinder and the intermediate temperature end of the second cylinder;

means for displacing the first cylinder (**102**) and the second cylinder (**202**) in phase relation,

characterized in that it comprises:

a gas bearing (**104***a*) at the hot end of the first piston (**104**) and a gas bearing (**104***b*) at the intermediate temperature end of the first piston;

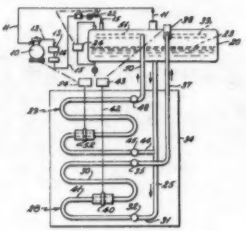
a gas bearing (**204***b*) at the intermediate temperature end of the second piston (**204**) and a gas bearing (**204***a*) at the cold end of the second piston.

4,840,033
ICE BUILDER AND CONTROL SYSTEM THEREFOR

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed Jun. 20, 1988, Ser. No. 208,677
Int. Cl.[4] F25D *3/02*
U.S. Cl. 62—59 **15 Claims**

1. An ice builder having evaporator means in at least two sections disposed at upper and lower levels of height for disposition in a tank of water, each having an inlet and an outlet, a refrigerant accumulator for separating liquid refrigerant from vapor, means connecting said evaporator means to said accumulator below its level of liquid refrigerant, means connecting each section outlet to said accumulator above its level of liquid refrigerant, valve means in the lower level section outlet, means sensing the thickness of ice on said lower level section, means for closing said valve means in response to a predetermined ice thickness, means sensing the thickness of ice on said

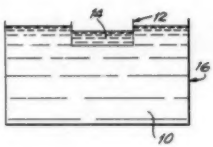


upper level section, means for supplying liquid refrigerant to said accumulator and withdrawing vapor therefrom, and means for discontinuing the withdrawal of refrigerant vapor from said accumulator in response to a predetermined ice thickness on said upper level coil section.

4,840,034
METHOD OF FREEZING VITAL BODY FLUIDS

Barnet L. Liberman, 421 Hudson St., New York, N.Y. 10014, assignor to Barnet L. Liberman; Winthrop D. Chamberlain, both of New York; Joseph Fedele and Brian Fedele, both of Queens, all of, N.Y., a part interest

Filed Jul. 14, 1988, Ser. No. 219,339
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **20 Claims**



1. A method of freezing vital body fluids comprising:

preparing a brine including at least 0.1% by weight of cruciferous oil;

cooling the brine to a temperature between about −22° and −43.6° F.;

providing a heat transfer container including a vital body fluid therein; and

bringing the heat transfer container into a heat transfer relationship with the cooled brine for a period of time sufficient to transmit cold from the cooled brine to the vital body fluid in the heat transfer container and freeze the vital body fluid.

4,840,035
METHOD OF FREEZING TISSUE

Barnet L. Liberman, 421 Hudson St., New York, N.Y. 10014, assignor to Barnet L. Liberman; Winthrop D. Chamberlain, both of New York; Joseph Fedele and Brian Fedele, both of Queens, all of, N.Y., a part interest

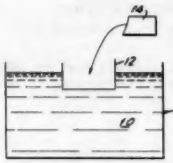
Filed Jul. 14, 1988, Ser. No. 219,330
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **20 Claims**

1. A method of freezing a tissue specimen comprising:

preparing a brine including at least about 0.1% by weight of a cruciferous oil;

cooling the brine to a temperature between about −22° and −43.6° F.;

providing a tissue specimen; and



subjecting the tissue specimen to a heat transfer relationship with the cooled brine for a period of time sufficient to freeze the tissue specimen.

4,840,036

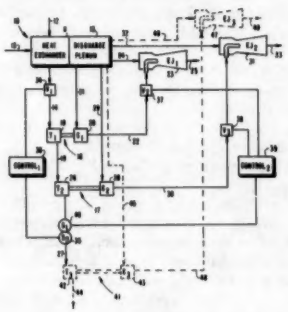
AIR CYCLE REFRIGERATION SYSTEM

Wilbur A. Spraker, Jr., Indianapolis, Ind., assignor to Household Manufacturing, Inc., Prospect Heights, Ill.

Filed Jun. 5, 1987, Ser. No. 58,927

Int. Cl.[4] F25D *9/00*

U.S. Cl. 62—172 **9 Claims**



1. An air cycle refrigeration system which comprises:

an air-to-air heat exchanger including a system air inlet and outlet and a coolant air inlet and outlet, the coolant air outlet of said heat exchanger comprising a discharge plenum;

first coupling means for coupling the system air inlet of said heat exchanger to a source of high-pressure, high temperature system air;

second coupling means for coupling the coolant air inlet of said heat exchanger to a source of coolant air;

a turbocharger including a turbine drivingly coupled to a compressor, the turbine having an inlet and an outlet, the inlet of the turbine being connected with the system air outlet of said heat exchanger, the compressor having an inlet and an outlet, the inlet of the compressor being connected with the coolant air outlet of said heat exchanger;

an ejector pump means having a first inlet connected with the compressor outlet and a second inlet connected with the coolant air outlet of said heat exchanger, said ejector pump means further including an outlet, said ejector pump means being for receiving air from the compressor outlet into the first inlet in a manner to draw additional inlet air from the coolant air outlet and through the second inlet of said ejector pump means and exhausting the air,

the outlet system air from the outlet of the heat exchanger driving the turbine and being exhausted therefrom at a reduced temperature, the turbine in turn driving the compressor which draws air from the plenum of said heat exchanger, the compressor exhausting high pressure air from the compressor outlet, the high pressure air from the outlet of the compressor being directed to said ejector pump means and operating to draw additional coolant air from the plenum;

compressor outlet control means for controlling the flow of air from the outlet of the compressor to said ejector pump means, and

sensor means for sensing the temperature of the air discharged through the outlet of the turbine, said compressor outlet control means being for controlling the flow of air from the outlet of the compressor to said ejector pump means in response to the sensed temperature of the air discharged through the outlet of the turbine.

4,840,037

REFRIGERATOR WITH COLD ACCUMULATION SYSTEM

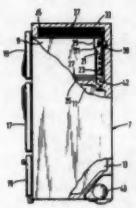
Koji Yamada, and Noriaki Sakamoto, both of Ibaraki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 8, 1988, Ser. No. 153,712

Claims priority, application Japan, Feb. 27, 1987, 62-029077[U]

Int. Cl.[4] F25B *5/00*

U.S. Cl. 62—199 **14 Claims**



1. A refrigerator having a compartment, comprising:

a cold accumulation material;

a refrigerating cycle for cooling said compartment and the cold-accumulation material;

means for cooling said compartment by heat transfer between said compartment and said cold-accumulation material;

load detecting means for measuring an amount of a load to be cooled;

clock counting means for generating time data; and

control means for causing said refrigerator to operate in accordance with first, second and third modes of operation wherein in said first mode said refrigerator compartment is cooled by the refrigerating cycle, wherein in said second mode said compartment is cooled by the cold-accumulation material, and wherein in said third mode the cold-accumulation material is cooled by the refrigerating cycle, said modes being carried out in accordance with said time data, the second mode operation having a time duration that is a function of load as determined by the load detecting means.

4,840,038

CONTROL DEVICE FOR USE IN A REFRIGERATION CIRCUIT

Motoharu Sato, Honjo, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 7, 1987, Ser. No. 129,669

Claims priority, application Japan, Dec. 6, 1986, 61-87389[U]

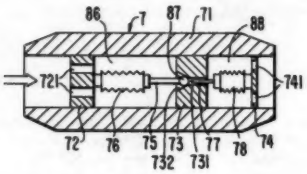
Int. Cl.[4] F25B *41/04*

U.S. Cl. 62—210 **8 Claims**

1. In a refrigeration circuit comprising a compressor, a condenser, a control device, an evaporator and an accumulator serially arranged to form a closed refrigerant circulation path,

the improvement comprising said control device including: a tubular casing; a first, second and third wall disposed on an interior surface of said tubular casing; said first wall having a plurality of holes therethrough, said second wall spaced from said first wall and having a longitudinal bore therethrough, and said third wall spaced from said second wall and having at least one hole therethrough;

a first bellows disposed in a region between said first wall and said second wall and having a valve element at one end thereof for controlling a flow of refrigerant through



said longitudinal bore in said second wall; and a second bellows disposed in a region between said second wall and said third wall and having a valve control element at one end extending through said longitudinal bore of said second wall, said valve control element contacting said valve element when said valve element has closed fluid flow through said longitudinal bore, said valve control element moving said valve element when the level of refrigerant fluid in said circuit is reduced below a predetermined level to allow fluid flow through said longitudinal bore.

4,840,039

AUTOMATIC EXPANSION VALVE FOR A REFRIGERATION CIRCUIT

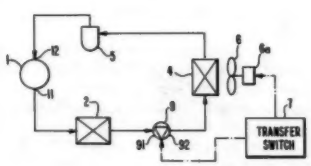
Takai Kazuhiko, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 21, 1988, Ser. No. 171,392

Claims priority, application Japan, Mar. 20, 1987, 87-41584[U]

Int. Cl.[4] B60H *1/32*

U.S. Cl. 62—244 **10 Claims**



8. An automotive air conditioning system having a refrigeration circuit including a compressor, a condenser, an expansion valve, an evaporator, and an accumulator connected in series, a fan associated with said evaporator, and a transfer switch for regulating the speed of said fan to thereby control air flow volume across said evaporator, the improvement comprising:

said expansion valve comprises two orifices and an actuator, a first orifice providing continuous communication through said expansion valve and a second orifice providing controllable communication through said expansion valve;

said actuator comprises an electromagnetic valve, said electromagnetic valve comprises an electromagnet and a valve element, and said valve element opens and closes said second orifice in accordance with the operation of said electromagnet as controlled by said transfer switch;

wherein the said second orifice is open when the air flow volume of said fan is a maximum and said second orifice is closed when the air flow volume of said fan is a minimum.

4,840,040

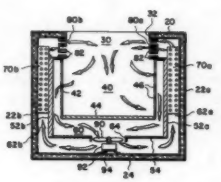
ISLAND TYPE REFRIGERATION DISPLAY CABINET

Kwok K. Fung, Niles, Mich., assignor to American Standard Inc., New York, N.Y.

Filed Sep. 22, 1988, Ser. No. 247,543

Int. Cl.[4] A47F *3/04*

U.S. Cl. 62—255 **14 Claims**



1. An island-type refrigeration display cabinet comprised of:

a cabinet having an interior display space therein and a top wall with an access opening therethrough;

means for forceably discharging at least two oppositely directed co-planar convergent air streams into said access opening, said air streams generating a multisectional single air curtain across said access opening, said forceable discharge means further comprises of a bifurcated conduit disposed in said cabinet, said bifurcated conduit including two discharge louvers in parallel spaced relationship, each said louver disposed at a respective side of said access opening for discharging one of said oppositely directed co-planar convergent air streams;

a motor driven fan element disposed in said bifurcated conduit; and

means for providing return air to said conduit from said interior display space, said return air means including a plurality of interior walls defining said interior display space, said interior walls having a plurality of return air apertures therethrough, and said return air means further including a return air conduit in said cabinet in flow communication with said return air apertures, said return air conduit having an aperture for flow communication with said bifurcated conduit.

4,840,041

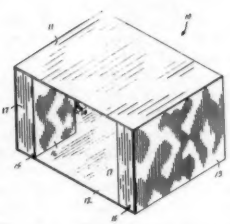
AIR CONDITIONER WALL SLEEVE

Eugene E. Nervina, 100 Manhattan Ave. 910, Union City, N.J. 07087

Filed Apr. 26, 1988, Ser. No. 186,233

Int. Cl.[4] F25D *23/12*

U.S. Cl. 62—263 **6 Claims**



1. An air conditioning wall sleeve for use in combination with a window unit air conditioner including a top face, bottom face, side faces, a forward face, and a rear face therein

defining outward surfaces of said air conditioner wherein said rear face includes a rear discharge vent for exhausting heated air from said air conditioner and side vents secured to rear portions of each side face of said air conditioner oriented adjacent said rear discharge vent on said side faces, said sleeve comprising,

a cabinet including a top wall,

a bottom wall,

a first side wall, and

a second side wall defining a rectangular parallel piped, and

a plurality of generally "U" shaped adapter means secured to an interior surface of each side wall wherein said adapter means is defined by a height substantially equal to a distance between said top wall and bottom wall and of a depth less than that of either side wall wherein said adapter means extends along the interior surface of each side wall a distance substantially less than that of the side wall, and

each of said plurality of adapter means spaced a distance apart between each other to substantially equal the distance between the side faces of the air conditioner, and

said cabinet including a plurality of rear louvers to define a rear wall of said cabinet of a length greater than the that of the rear face of the air conditioner, and

wherein said cabinet defines a space means between said adapter means and said rear wall and between the side vents of the air conditioner and the interior surfaces of each side wall opposed to said side vents for enabling intake air to be directed through said louvers and said space means and ultimately directed to said side vents.

4,840,042

HEAT PUMP SYSTEM

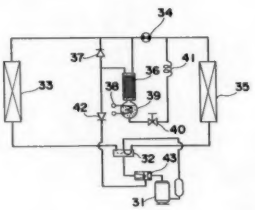
Mitsuhiro Ikoma, Nara; Kazuo Nakatani, Osaka; Yuji Yoshida, Hyogo; Takeshi Tomizawa, Nara, and Koji Arita, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 29, 1988, Ser. No. 226,084

Claims priority, application Japan, Jul. 31, 1987, 62-192949; Oct. 26, 1987, 62-269631; Oct. 26, 1987, 62-269632

Int. Cl.[4] F25B *13/00*

U.S. Cl. 62—324.1 **10 Claims**



1. A heat pump system which comprises:

a main heat pump circuit filled with non-azeotropic mixed coolant and including a compressor, a utility-side heat exchanger, a throttling device, a source-side heat exchanger, etc.;

a fractionating separator having an upper end fluid-connected with an exit side of the utility-side heat exchanger;

a reservoir disposed beneath the fractionating separator and having a bottom fluid-connected through a shut-off valve with a low pressure piping on an inlet side of either the source-side heat exchanger or the utility-side heat exchanger; and

a coolant ejector disposed between the compressor and the utility-side heat exchanger, wherein a gaseous medium generated from the fractionating separator when the reservoir is heated is guided to a suction port of the coolant ejector to flow into the main heat pump circuit.

4,840,043

CRYOGENIC REFRIGERATOR

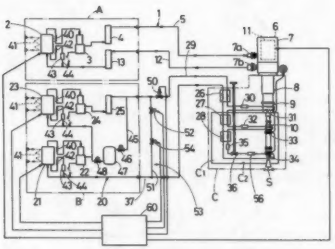
Katsumi Sakitani; Yoon M. Kang; Shinichiro Shinozaki; Shoichi Taneya; Kazuo Miura; Tadashi Ogura, and Satoshi Noguchi, all of c/o Kanaoka Factory, Sakai Plant, Daikin Industries, Ltd., 1304 Kanaoka-cho, Sakai-shi, Osaka 591, Japan

Filed May 18, 1987, Ser. No. 50,475

Claims priority, application Japan, May 16, 1986, 61-113332; May 16, 1986, 61-113333

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—51.2 **11 Claims**



1. A cryogenic refrigerator for maintaining a low temperature working apparatus at a cryogenic level, said cryogenic refrigerator comprising:

a precooling refrigerating circuit including a compressor for compressing refrigerant gas, and an expander operatively connected to said compressor for expanding the gas compressed by said compressor thereby lowering the temperature of the refrigerant gas,

said expander including heat stations which are maintained at respective lowered temperatures of the refrigerant gas;

a J-T circuit including a precooler in a heat exchange relationship with the heat stations of said expander for undergoing heat exchange therewith to precool refrigerant gas in the J-T circuit, a J-T valve operatively connected to said precooler for Joule-Thomson expanding the precooled refrigerant gas into a gas/liquid state, and a cooler operatively connected to and downstream of said J-T valve;

a cryostat in which the heat stations of said expander, said J-T valve and said cooler are disposed, said cryostat including a cryogenic maintaining part in which said cooler is disposed for supporting the low temperature working apparatus within said cryostat adjacent said cooler to maintain the low temperature working apparatus at a cryogenic level resulting from evaporation of the liquid of the refrigerant gas existing in a gas/liquid state after the expansion thereof by said J-T valve disposed upstream of said cooler;

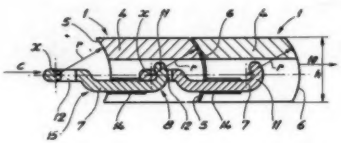
a precooling refrigerating circuit stop means operatively connected to said precooling refrigerating circuit and said J-T circuit for stopping the operation of said precooling refrigerating circuit; and

a control means operatively connected to said precooling refrigerating circuit stop means for activating said precooling refrigerating circuit stop means to stop the operation of said precooling refrigerating circuit while causing said J-T circuit to operate while the low temperature working apparatus is to be operated.

4,840,044
ARTICULATED WRISTLET

Werner Scholpp, Oberriexingen, Fed. Rep. of Germany, assignor to Montres Rado S.A., Lengnau, Switzerland

Filed Feb. 3, 1988, Ser. No. 151,681
Claims priority, application France, Feb. 5, 1987, 87 01512
Int. Cl.[4] A44C 5/02
U.S. Cl. 63—4 7 Claims



3. An articulated wristlet having a plurality of decorative elements, said elements being arranged side by side along a longitudinal axis,

a flexible inner core,

assembly means fixing said decorative elements to said inner core,

said assembly means having a plurality of sliding type slide fittings, whereby the decorative elements are mounted on the slide fittings in a manner such that movement of the decorative elements is only permitted in a direction longitudinal to said wristlet,

each decorative element having a lateral face which covers at least partially the lateral face of an adjacent element in order to lock said elements between them when the wristlet is worn normally,

said lateral faces being shaped in such a manner that they uncover one another when the wristlet is folded beyond a predetermined angle, thus permitting the releasing and the removal of any one decorative element located anywhere along the wristlet by sliding said one decorative element along the sliding type fitting on which it is mounted;

said flexible inner core having a plurality of linking elements, said linking elements being present in the same number as the number of decorative elements, said linking elements being further articulated to one another in series by means of hinges, said hinges being capable of being unhooked, said decorative elements and said linking elements being provided with said assembly means, said releasing permitting the removal of a decorative elements from the wristlet by sliding said decorative element along the corresponding assembly means, followed by the unhooking of said linking element.

4,840,045
JEWELRY MOUNTING CONSTRUCTION

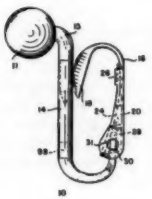
Leonardo Moody, Downers Groove, Ill., assignor to Luc-Co., Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 930,271, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 832,843, Feb. 4, 1986, Pat. No. 4,655,055, which is a continuation of Ser. No. 728,444, Apr. 30, 1985, Pat. No. 4,574,595, which is a continuation of Ser. No. 460,284, Jan. 24, 1983, abandoned. This application Mar. 4, 1987, Ser. No. 21,804
Int. Cl.[4] A44C 7/00
U.S. Cl. 63—12 3 Claims

1. A construction for adapting a standard pierced-ear earring for attachment to non-pierced ears when the pierced-ear earring is of the kind having a linear post for insertion through an ear lobe, the construction comprising, in combination:

a receptacle for the post, the receptacle being configured as a linear tube having a central linear bore and being adapted at one end to receive the earring post, the receptacle's bore containing an elastic material that compresses upon insertion of the post into the receptacle and retains the post within the receptacle by a friction fit; and

means for clamping the receptacle to an ear lobe the means

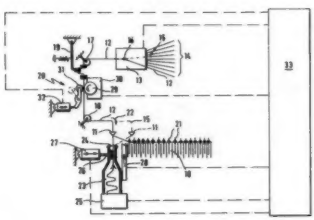


being configured as a spring clip that positions the receptacle parallel to the ear lobe, whereby the earring is attached to an ear without insertion of the post into the ear lobe.

4,840,046
PROCEDURE AND DEVICE FOR ENSURING A PRECISELY POSITIONED INTRODUCTION OF A SUBSTITUTE YARN IN A KNITTING MACHINE

Ernst Goller, Reutlingen, and Fritz Walker, Kusterdingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,198
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712264
Int. Cl.[4] D04B 15/54
U.S. Cl. 66—144 16 Claims



4. An apparatus for ensuring a precisely positioned introduction of a substitute yarn on a knitting machine having at least one yarn feeder in the region of the yarn working position, to which the yarn is guided selectively from several yarn storage bobbins through a yarn changing device, characterized in that there is provided on the yarn path between the yarn changing device and the yarn working position a yarn take-up device, means for driving the yarn take-up device independently of the knitting machine drive, and including a yarn collection container between the yarn feeder and the yarn working position, a yarn clamp for clamping the yarn in the yarn collection container and a yarn cutting device for cutting a drawn out length of yarn, and including a control device for controlling operation of the yarn take-up device the yarn collection container, the yarn clamp and the yarn cutting device.

4,840,047

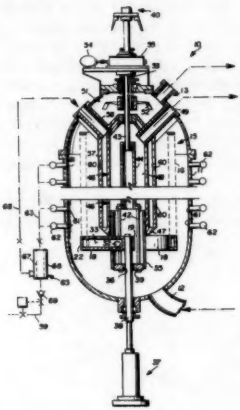
MULTISCREEN PRESSURE DIFFUSER

Johan C. F. C. Richter, Oslo, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden

Continuation-in-part of Ser. No. 125,710, Nov. 27, 1987. This application May 18, 1988, Ser. No. 195,670

Int. Cl.[4] D21C 9/00

U.S. Cl. 68—181 R **19 Claims**



1. A pressure diffuser comprising:

(a) a generally vertical pressurizable liquid tight vessel having a slurry inlet adjacent the bottom and a slurry outlet adjacent the top;

(b) at least one ring shaped screen element, providing first and second concentric screen surfaces, mounted generally vertically within said vessel;

(c) a plurality of radially extending header arms mounting said screen element for movement in said vessel, and in fluid communication therewith;

(d) first linear actuator means mounted in vertical alignment with said vessel and operatively connected to said arms for effecting reciprocation thereof;

(e) a cylinder, open at both ends, affixed to said arms and extending above and below them to define a generally vertical pathway;

(f) a piston disposed within said cylinder generally below said arms for reciprocation therewithin;

(g) second linear actuator means disposed in vertical alignment with said vessel;

(h) means for operatively connecting said piston to said second actuator to effect reciprocation of said piston in said cylinder;

(i) a guiding conduit surrounding an open end of said cylinder generally above said arms, for guiding reciprocation of said cylinder with said arms and for transporting liquid from said arms; and

(j) an effluent outlet connected to said guiding conduit for carrying effluent liquid from said guiding conduit to a location remote from said vessel.

4,840,048

HANDCUFF RESTRAINING APPARATUS AND METHOD OF USE

Dennis C. Elam, 2606 Pawnee No. 8, Garden City, Kans. 67846

Continuation of Ser. No. 898,660, Aug. 21, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 96,270

Int. Cl.[4] E05B 75/00

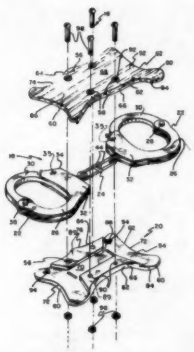
U.S. Cl. 70—16 **15 Claims**

1. A handcuff restraining assembly adapted to be used by a law enforcement officer or the like to restrain a suspect, comprising:

(a) a handcuff assembly having a pair of handcuff bracelet members interconnected by a connector member;

(b) said handcuff bracelet members having a clasp pivotally connected to a base member operable to restrain and selectively anchor a suspect's wrist area therein;

(c) a restraining assembly connected about a portion of said



handcuff bracelets and enclose said connector member to provide a rigid, non-moving interconnection between said handcuff bracelet members and said restraining assembly; and

(d) said restraining assembly having a main handle assembly the size and configuration operable to receive the restraining officer's hand thereabout and to provide firm gripping thereof so as to move said handcuff bracelet members in an inclined and twisting manner as required.

4,840,049

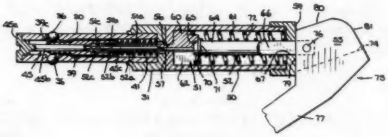
PLUNGER LOCK AND KEY

Onofrio N. Russo, Middle Village, N.Y., assignor to Gas Energy, Inc., Brooklyn, N.Y.

Filed Sep. 26, 1986, Ser. No. 911,767

Int. Cl.[4] E05B 67/36

U.S. Cl. 70—34 **16 Claims**



1. An improved plunger lock, comprising:

a housing open at both ends;

a lock operating plunger axially moveable in said housing and biased in a first axial direction therein to locking position, said plunger having an axial bore extending there through said plunger further including tool-engagable means; and

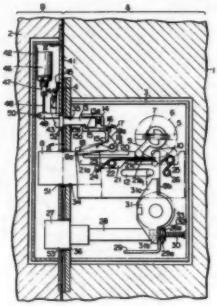
security means fixedly mounted against movement relative to said housing and extending through said bore in said plunger in a second axial direction toward an end of said housing.

4,840,050

LOCK DEVICE WITH TRIGGER BOLT

Motohiro Gotanda, 1802-10, Nakabiyo, Abiko-shi, Chiba-ken, Japan

Filed Apr. 10, 1987, Ser. No. 36,615
Claims priority, application Japan, Apr. 14, 1986, 61-84350
Int. Cl.[4] E05B 63/14
U.S. Cl. 70—107 17 Claims



1. A locking device for locking a door in a door frame comprising a locking portion on said door and a fixing portion on said door frame, said locking portion comprising a rotation lever means rotatably mounted on said door, a dead bolt moveable in said door between a locked and an unlocked position, said rotation lever means being engageable with said dead bolt to move said dead bolt from its locked to its unlocked position, a rotating plate means rotatably mounted on said door and rotatable in one direction to engage and move said dead bolt from its locked to its unlocked position, a latch means moveably mounted on said door between a latched and an unlatched position, said rotating plate means being engageable with said latch means to move said latch means from said latched to said unlatched position, a trigger bolt means mounted on said door for movement between a trigger-locked and a trigger-released position, said trigger bolt means in said trigger-locked position locking said dead bolt in its locked position, said trigger bolt means in said trigger-release position releasing said dead bolt so that said dead bolt is moveable from its locked to its unlocked position, said fixing portion comprising a pressing-operable means mounted on said door frame and moveable between an engaged position and a released position, said pressing-operable means when in said engaged position and with the door closed being engageable with said trigger bolt means to maintain said trigger bolt means in said trigger-locked position, said pressing-operable means when in said released position and with the door closed being operable to release said trigger bolt means to its trigger-release position so that the door can be opened.

4,840,051

STEEL ROLLING USING OPTIMIZED ROLLING SCHEDULE

Francisco Boratto, Westmount; Stephen Yue, Montreal, and John J. Jonas, Westmount, all of Canada, assignors to Ipsco Inc., Canada

Filed Jun. 1, 1987, Ser. No. 55,945
Int. Cl.[4] B21B 1/00
U.S. Cl. 72—11 14 Claims

1. In the rolling of steel of a known alloy composition in a rolling mill whose operating conditions are known or measurable by a selected number of sequential reduction passes at steadily declining steel temperatures between rolls separated by sequentially diminishing gaps,

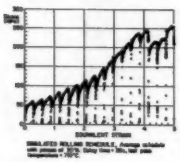
the improvement comprising rolling the steel in accordance with a rolling schedule determined in accordance with the following procedure:

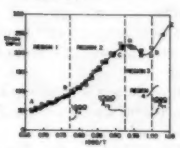
(a) applying to a specimen of the steel a series of thermomechanical workings at selected strain levels imparted during selected steel temperatures, and separated by selected rest time intervals, all selected to simulate the sequence of reduction passes of the steel under the conditions encountered in the rolling mill;

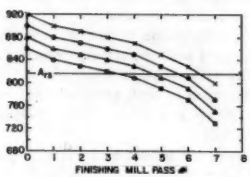
(b) comparing stress values obtained from the series of workings with the inverse of the temperatures of the steel at which the respective values were obtained thereby to determine the upper limit of the austenite-ferrite cooling transformation temperature range;

(c) repeating step (a) for a series of specimens of the steel at selected varying starting and terminating temperatures thereby to obtain a series of possible rolling schedule simulations having a varying number of reduction passes in the sequence thereof occurring at steel temperatures below said upper limit;

(d) measuring the value of a selected property at ambient temperature of specimens of the steel each of which has







undergone a discrete one of the rolling schedule simulations; and

(e) selecting from the rolling mill analogue of possible rolling schedule simulations at least one predetermined rolling schedule which will predictably impart to the steel a value of said selected property falling within a predetermined range.

10. In the rolling of microalloyed steel of a known alloy composition in a rolling mill whose operating conditions are known or measurable by a selected number of sequential reduction passes at steadily declining steel temperatures between rolls separated by sequentially diminishing gaps, and wherein the upper limit of the austensite-ferrite cooling transformation temperature range is sufficiently accurately known or estimated,

the improvement comprising rolling the steel in accordance with a rolling schedule determined in accordance with the following procedure:

(a) applying multiple linear regression analysis to rolling mill data obtained from the measurement of selected parameters including at least steel temperature at the

final reduction pass, time elapsed and total strain between the reaching of the said upper limit and the final pass, carbon content of the steel, thereby to derive a linear relationship therebetween and a selected property of the steel; and

(b) selecting a set of values for controllable parameters in said linear relationship to derive at least one predetermined rolling schedule which will predictably impart to the steel a value of said selected property falling within a predetermined range.

4,840,052

MOBILE NOZZLE DEVICE FOR DIE LUBRICATING

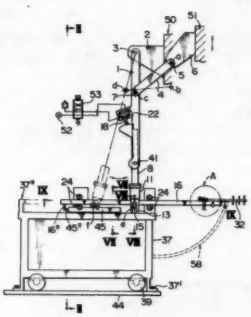
Yasuhira Takata, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,961

Claims priority, application Japan, Dec. 30, 1987, 62-200823[U]

Int. Cl.[4] B21C *9/00*

U.S. Cl. 72—45 **6 Claims**



1. A mobile nozzle device for spraying a lubricant onto surfaces of dies in a forging press when said press is in an open position and said dies are separated, comprising: lever means pivotally connected at an upper end thereof to a frame of said forging press through a pivot shaft, said lever means being connected at an intermediate portion thereof to a press slider of said forging press such as to swing about said pivot shaft in response to the vertical movement of said slider; a guide member secured to a lower end of said lever means and having a guide portion extending in the longitudinal direction of said lever means; a horizontal bar member horizontally movably carried by a truck and carrying a roller positioned for engagement with said guide portion of said guide member; and a mobile nozzle mounted on an end of said horizontal bar member; whereby said horizontal bar member is moved horizontally to position said mobile nozzle into and out of a space between the seperated dies of said forging press by the engagement of said roller with said guide portion of said guide member, in response to vertical movement of said press slider.

4,840,053

METHOD FOR MANUFACTURING A PIPE WITH PROJECTIONS

Masanobu Nakamura, Kamakura, Japan, assignor to Mitsui & Co., Ltd., Tokyo and Kokan Kako Co., Ltd., Yokohama, both of, Japan

Filed Dec. 30, 1987, Ser. No. 139,811

Claims priority, application Japan, Jul. 29, 1987, 62-189384; Aug. 17, 1987, 62-203841

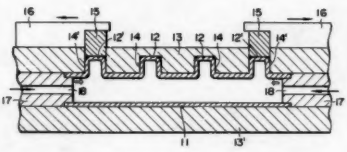
Int. Cl.[4] B21D *26/02*

U.S. Cl. 72—58 **11 Claims**

1. A method for manufacturing a pipe with projections using an apparatus which includes a bulge mold having at least one fixed space at an axially middle position and having variable spaces at the sides of the at least one fixed space, detachable members detachably mounted in the variable spaces to fully occupy the variable spaces, and holding members which press a pipe member inside the bulge mold from both ends, said method comprising the steps of:

housing the pipe member in the bulge mold, with the detachable members being mounted in the variable spaces;

holding tightly the pipe member with the bulge mode;



introducing pressurized fluid into the pipe member and using the holding members to apply pressure on the pipe member toward the center thereof to bulge an intermediate portion thereof to form at least one projection;

removing the detachable members from the variable spaces after the at least one projection is formed; and

introducing pressurized fluid into the pipe member and using the holding members to apply pressure on the pipe member toward center thereof to form bulged portions at positions closer to the ends of the pipe member.

4,840,054

ARRANGEMENT FOR PROFILING FORWARDLY INDEXED MATERIAL WEBS

Börje Sjögren, Huddinge, Sweden, assignor to Nordisk Kartro AB, Farsta, Sweden

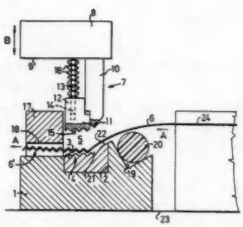
PCT No. PCT/SE87/00491, § 371 Date Jun. 8, 1988, § 102(e) Date Jun. 8, 1988, PCT Pub. No. WO88/03067, PCT Pub. Date May 5, 1988

PCT Filed Oct. 23, 1987, Ser. No. 205,397

Claims priority, application Sweden, Oct. 24, 1986, 8604557

Int. Cl.[4] B21D *13/02*

U.S. Cl. 72—382 **6 Claims**



1. An arrangement for profiling a forwardly indexed material web (6), and more specifically for forming mutually parallel, transverse undulations in a sheet-metal web, which is preferably of uniform width and which is indexed forwardly through a forming space (5) provided in the arrangement, characterized in that the forming space (5) is located between a lower bed (1), which carries thereon a die (3) having an upwardly turned forming surface (4,21) comprising a forming location (21), and a holding device (8) located above the forming space and which carries a punch mechanism (7) driven reciprocatingly towards and away from the die (3) and which is arranged to be brought into forming or shaping impact with the web (6) and the forming surface (421) of the die; an inclined ramp surface (22) arranged adjacent said forming location to

guide the material web obliquely downwards towards the forming location (21) on the forming surface of the die; and a resiliently yieldable web-support body (20) mounted in the proximity of the ramp surface for yielding resiliently in a direction transversely to the plane of the ramp surface when the web is stretched over the body as a result of forces exerted by the punch mechanism (7) on the web (6) during a profiling operation.

4,840,055

DRAWING APPARATUS IN A PRESS

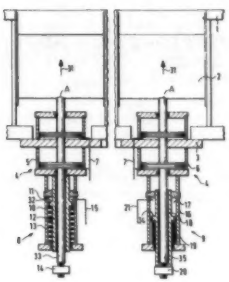
Wolfgang Michael, Goeppingen, and Martin Kaletka, Boll, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,893

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702069

Int. Cl.[4] B21D *45/04, 22/20*

U.S. Cl. 72—345 **8 Claims**



1. A drawing apparatus in a press, comprising pressure plate means, which is raised and lowered by draw cushion means driven by an operating pressure media, for the counter-holding of a sheet metal draw part during the drawing operation in an active direction and for the ejection of the sheet metal draw part, at least one blocking means for delaying the upward movement of the pressure plate means to the upward movement of a press ram including pressure cylinder means and pressure piston means with an active surface coordinated with a pressure space and adapted to be acted upon by a hydraulic liquid from a pressure line in a direction opposite the active direction of the counter-holding during the drawing operation, piston rod pivotably connected with the pressure plate means, the pressure piston means being displaceably supported on the piston rod, the piston rod, protruding out of the side opposite the active surface of the pressure piston means and including thereat an abutment, and the side of the pressure piston means opposite the active surface being continuously acted upon by pressure so that the pressure piston means will move away from the abutment when the active surface of the pressure piston means is not acted upon with a pressure and the pressure piston means is placed against the abutment when the active surface of the pressure piston means is acted upon with the pressure of a hydraulic liquid from the pressure line.

4,840,056

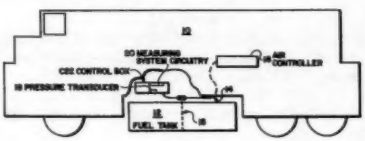
FUEL MEASURING SYSTEM

Emilio A. Fernandez, Fairfax County, Va.; Angel P. Bezos, Montgomery County, and Charles H. Kimball, Carroll County, both of Md., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed Dec. 11, 1987, Ser. No. 131,639

Int. Cl.[4] G01F *23/18, 23/14, 25/00*

U.S. Cl. 73—1 H **12 Claims**



1. A fuel measuring system of the bubble type comprising:

at least first and second bubbling tank tubes mounted at predetermined locations in a tank containing a liquid;

means for passing a predetermined constant volume of air through each of said bubbling tank tubes;

means for periodically measuring the pressure of the air supplied to each of said bubbling tank tubes and generating pressure data corresponding to the measured pressures for each of said bubbling tank tubes;

microprocessor means receiving said pressure data and programmed to compute a normalized pressure value for each of said bubbling tank tubes, averaging said normalized pressure values and then, using the averaged normalized pressure value, deriving the instantaneous volume of fuel in the tank; and

display means responsive to said microprocessor means for displaying the amount of fuel in the tank.

4,840,057

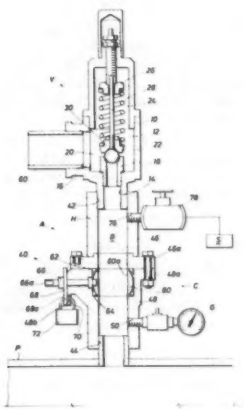
METHOD AND APPARATUS FOR TESTING RELIEF VALVE

George H. Bingham, P.O. Box 10706, Bakersfield, Calif. 93309

Filed Feb. 19, 1988, Ser. No. 157,593

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—4 R **5 Claims**



1. Apparatus adapted for testing of a pressure safety valve while enabling the pressure safety valve to remain operational, including:

a housing having an internal flow passage formed therethrough;

means for connecting said housing with a contained source of operating fluid under pressure to communicate said operating fluid into said internal flow passage;

means for connecting said housing with the pressure safety valve to communicate the operating fluid to the inlet of the pressure safety valve;

valve means mounted with said housing for controlling communication through said flow passage, said valve means movable between an open position providing substantially unrestricted communication through said flow passage and a closed position for substantially blocking communication through said flow passage;

actuator means mounted with said housing for manually moving said valve means to and from the open and closed position from exteriorly of said housing;

said actuator means having means for enabling locking of said actuator means with said housing to prevent undesired movement of said valve means from the open position.

4,840,058

METHOD OF LEAK TESTING A CAVITY

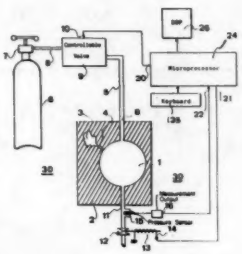
Elie Cohen, Paris, France, assignor to Societe De Traitement Automatique - Control et Etanchelte, Fresnes, France

Filed Apr. 1, 1988, Ser. No. 176,548

Claims priority, application France, Apr. 2, 1987, 87 04608

Int. Cl.[4] G01M *3/26*

U.S. Cl. 73—40 **5 Claims**



1. A method of leak testing at least one "main" cavity formed in a body, the method consisting in filling said main cavity with a test gas at a determined pressure, in measuring the leakage pressure variation in said main cavity while reducing the pressure inside said main cavity in steps (dp_n) by means of a controllable valve, and in comparing the various values of leakage pressure variation, with equal values being representative of a part that may be leaky, and with values that becomne smaller from one measurement to another being representative of the presence of at least one secondary cavity communicating with said main cavity via a seepage path having high head loss, said two cavities taken together being possibly non-leaky.

4,840,059

METHOD FOR ADJUSTING FUEL INJECTION QUANTITY OF ELECTROMAGNETIC FUEL INJECTOR

Tatsuo Okada, Okazaki; Sadao Sumiya, Takahama, and Masakimi Nakano, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 20, 1988, Ser. No. 222,083

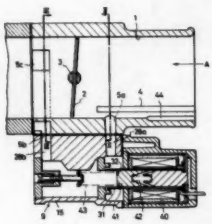
Claims priority, application Japan, Jul. 21, 1987, 62-180062

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A **5 Claims**

1. A method for adjusting the fuel injection quantity of an electromagnetic fuel injector composed of a needle valve reciprocally accommodated in a valve body for opening and closing a nozzle hole, and an electromagnetic actuator for reciprocally moving said needle valve, said electromagnetic actuator having a movable core which moves with said needle valve, and a fixed iron core for attracting said movable core to move said needle valve to its open position, an adjust pipe being provided within a through hole formed in said fixed iron core, and a spring being interposed between a tip end portion of said adjust pipe and said movable core for continuously biasing said needle valve to its closed position, comprising the steps of:

inserting said adjust pipe into said through hole of said fixed iron core by a predetermined length and temporarily fixing said adjust pipe to said fixed iron core so as not to be



moved by a force received from said spring when said needle valve is operated and so as to start moving when a force larger than said force of said spring is applied;

reciprocating said needle valve with said adjust pipe temporarily fixed to said fixed iron core for a predetermined period of time for running in said electromagnetic fuel injector;

finely adjusting the position of said adjust pipe while checking actual fuel injection quantity; and

unmovably fixing said adjust pipe to said through hole of said fixed iron core by caulking an outer peripheral portion of said fixed iron core at such a position that said injector injects a desired fuel injection quantity.

4,840,060

ARRANGEMENT FOR THE DETERMINATION OF THE INJECTION PROGRESS IN AN INTERNAL COMBUSTION ENGINE

Wolfgang Notz, Puchheim; Volker Schwarz, Weinstadt, and Ulrich Augustin, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,111

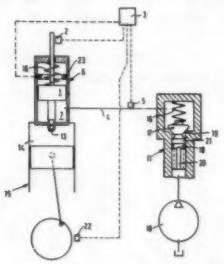
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707927

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A **26 Claims**

1. An arrangement for determining the injection course in an internal combustion engine, comprising injection pump means, injection valve means connected with the injection pump means by way of a line means, the injection valve means including an injection nozzle means operable to be closed by a closure means which is displaceably arranged in the manner of a piston in an antespace connected with the line means and is acted upon in the opening direction by the pressure of the injection medium supplied by way of the line means against a return force, stroke and movement transmitter means operatively coupled with the closure means, computer means for processing signals, said stroke and movement transmitter means being operatively connected with the input of the computer means, said signals reproducing the stroke movement and position of the closure means, the computer means being operable during the time interval of the stroke movement of the closure means between the closing and opening position thereof to determine by means of the sigals of the stroke and

movement transmitter means the velocity and acceleration of the closure means and therefrom the pressure in the antechamber as well as the volumetric flow leaving the nozzle means, respectively, the discharge quantity according to the following equations:



$$p_D A = m \cdot d^2h/dt^2 + R \cdot dh/dt + K \cdot h + F_1 + F_2 \quad \text{(I)}$$

$$dQ/dt + f(h,X)\sqrt{(p_D - p_G)\,2/\rho} \quad \text{(II)}$$

$$Q = \int dQ/dt \quad \text{(III)}$$

whereby

p_D=pressure in the nozzle antechamber,

p_G=pressure in the combustion space, respectively, on the outlet side of the nozzle,

A=cross section of the closure element acted upon by the pressure p_D in the opening direction,

m=mass of the closure element,

h=stroke of the closure element,

t=time,

R=damping, respectively, friction coefficient of the stroke movement of the closure element,

K=spring constant of the return force,

F_1=prestress of the return force,

F_2=friction coefficient,

Q=quantity of the injection medium leaving the nozzle,

ρ=density of the injection medium,

f(h,X)=a predetermined function, dependent on the stroke (h) of the closure element and on the pressure factor X, and

$X=(p_D-p_G)/p_G$=dimensionless pressure factor.

4,840,061

METHOD OF DETECTING A FLUID INFLUX WHICH COULD LEAD TO A BLOW-OUT DURING THE DRILLING OF A BOREHOLE

Bertrand Peltier, Cambridge, Great Britain, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 8, 1988, Ser. No. 216,579

Claims priority, application France, Jul. 15, 1987, 87 09963

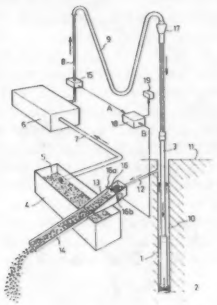
Int. Cl.[4] E21B *47/00*

U.S. Cl. 73—155 **7 Claims**

1. A method of detecting a fluid influx in a well being drilled, such as an oil well, said fluid influx possibly resulting in a blow-out, the detection being based on the difference between the inlet (A) and outlet (B) flowrates of the drilling mud injected into the well, said method comprising the steps of measuring the inlet rate A and the outlet rate B of the drilling mud and forming the quantity:

$$C = a \cdot B - A$$

where a is a scale factor the value of which may be altered in order to produce a recalibration of the outlet flow rate measurement; effecting this recalibration whenever the average value of quantity C, in relation to the period of time involved, identifies a significant difference between the inlet and outlet flowrates; and setting off an alarm when, over a fixed period of



time, a certain predetermined number of consecutive recalibrations corresponding to an outlet flowrate which exceeds the inlet flowrate takes place, each of them corresponding to an increase in the average value of quantity C.

4,840,062

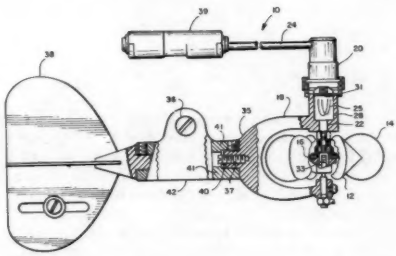
FIBER OPTIC CURRENT METER WITH PLASTIC BUCKET WHEEL

James C. Futrell, II, Picayune, Miss., assignor to The United States of America as represented by the Secretary of Interior, Washington, D.C.

Filed Sep. 10, 1987, Ser. No. 94,975

Int. Cl.[4] G01D *21/00*

U.S. Cl. 73—170 A **7 Claims**



1. A current meter for measuring velocity of a moving fluid, said current meter comprising:

a one-piece plastic bucket wheel assembly comprising a plurality of cups connected to and formed integrally with a central ring mounted for rotation on a rotatable shaft, said cups being disposed in spaced relation around the periphery of the ring and said bucket wheel assembly being capable of rotating in response to fluid movement;

means for suspending said bucket wheel assembly in a moving fluid so that said bucket wheel assembly rotates in response to fluid movement; and

a signal generating means, including a fiber optic cable means connected to said rotatable shaft upon which said bucket wheel assembly is mounted and disposed so as to create a light path which is broken during the rotational movement of said bucket wheel assembly, for generating a signal proportional to the velocity of the moving fluid.

4,840,063

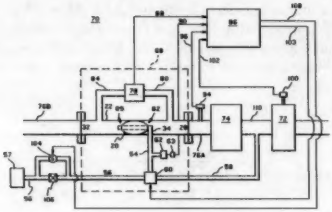
FAIL SAFE VALVE FOR AN AIR INLEAKAGE MONITORING SYSTEM IN A STEAM TURBINE

Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 49,493, May 14, 1987, Pat. No. 4,787,408. This application Aug. 17, 1988, Ser. No. 232,983

Int. Cl.[4] G01F *5/00*

U.S. Cl. 73—203 **9 Claims**



1. A fail-safe bypass monitor for measuring the volumetric flow rate of normally low pressure air inleakage evacuated from a steam turbine condenser and exhausted through a segment of vent pipe, comprising:

(a) bypass flowmeter means, positioned between the condenser and the vent pipe segment to receive air from the condenser and to exhaust air through the vent pipe segment, for providing a first signal indicative of volumetric air flow rate from the condenser;

(b) a tube having a first end for receiving air flow from the condenser and a second end connected to the vent pipe segment;

(c) an inflatable bladder positioned within said tube for sealing off relatively low pressure air flow through the vent pipe segment to divert the air flow to said flowmeter means and for permitting relatively high pressure air flow through the vent pipe segment when air pressure between the condenser and said inflatable bladder exceeds a preselected value;

(d) means for providing a second signal when air pressure between the condenser and said inflatable bladder exceeds the preselected value;

(e) mechanical means for inflating and deflating said bladder; and

(f) control means responsive to the first and second signals for controlling said mechanical means.

4,840,064

LIQUID VOLUME MONITORING APPARATUS AND METHOD

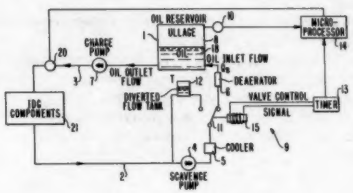
Efrem V. Fudim, Milwaukee, Wis., assignor to Sundstrand Corp., Rockford, Ill.

Filed Mar. 15, 1988, Ser. No. 168,477

Int. Cl.[4] G01F *23/14*

U.S. Cl. 73—290 B **20 Claims**

1. An apparatus for determining the volume of liquid in a container which is being provided with an in flow of liquid and an out flow of liquid such that there normally remains an ullage volume in the container which is filled with gas comprising means for interrupting one of the flows of liquid, means for detecting the pressure of the gas in the ullage volume of the container during an interruption of said one of the flows of liquid, and means for calculating the volume of liquid in said container from a change in the pressure of the gas in the ullage



volume of said container during an interruption of said one of the flows of liquid.

4,840,065

DRIED LOAD DETECTOR FOR DRY-CLEANING MACHINES

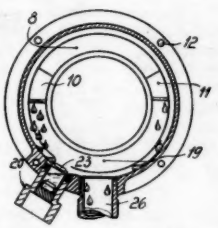
Tommaso Arbizzani, Pontecchio Marconi, Italy, assignor to Sodibo S.p.A., Bologna, Italy

Filed Sep. 21, 1987, Ser. No. 99,357

Claims priority, application Italy, Sep. 30, 1986, 3529 A/86

Int. Cl.[4] G01F *23/24*

U.S. Cl. 73—295 **6 Claims**



1. Dried load detector for dry-cleaning machines comprising a case arranged on a duct connecting a vapor condensing assembly to a separator, said vapor being essentially composed of water and a solvent, said case comprising an inlet conduit and an outlet conduit and defining at least one inlet chamber and one outlet chamber separated by a partition, said partition comprising a solvent aperture and a water aperture located at different heights and connecting said inlet chamber to said outlet conduit, a solvent level detector being provided between said solvent aperture and said outlet conduit whereby a load dryness is detected as a function of the solvent level.

4,840,066

ULTRASONIC THICKNESS GAUGE HAVING AUTOMATIC TRANSDUCER RECOGNITION AND PARAMETER OPTIMIZATION AND METHOD THEREOF

Ronald J. Botsco, Huntington Beach; Robert L. Jones, Anaheim, and David E. Methe, Lake Forest, all of Calif., assignors to NDT Instruments, Inc., Huntington Beach, Calif.

Filed Jun. 27, 1988, Ser. No. 211,791

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—597 **3 Claims**

1. In an ultrasonic thickness gauge of the type having a transducer to contact a workpiece, a pulser to transmit an ultrasonic pulse into the workpiece through the transducer, a receiver for receiving an echo of the transmitted pulse, a logic circuit for calculating the time elapsed between the transmitted

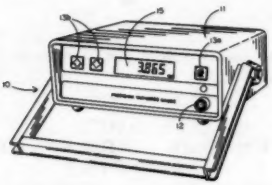
and received pulses for measuring the thickness of the workpiece and a display for displaying measured thicknesses; the improvement comprising:

means in said transducer for identifying the type of transducer;

means in said gauge for automatically recognizing said transducer type identifying means;

means in said gauge, responsive to said recognizing means, for automatically setting gauge parameters in accordance with the recognized transducer type;

wherein said transducer type identifying means comprises an electrical component in the electrical circuit of said transducer;



wherein said recognizing means comprises a current source for applying electrical current to said component and means for measuring the voltage differential across said component induced by said current;

wherein said measuring means comprises an analog-to-digital converter;

wherein said setting means comprises a memory device having stored therein a plurality of parameter sets, each such set corresponding to an output of said analog-to-digital converter, said setting means further comprising means for controlling said gauge in accordance with said parameter sets; and

wherein at least one parameter in said parameter sets comprises the position of a decimal point in said display.

4,840,067

SEMICONDUCTOR PRESSURE SENSOR WITH METHOD DIAPHRAGM

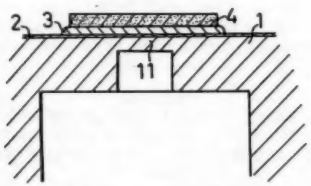
Minoru Nishida, Okazaki; Naohito Mizuno, Nishio; Tadashi Hattori, Okazaki; Seizi Huzino, Anjo, and Yoshiyasu Ando, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 15, 1987, Ser. No. 50,031

Claims priority, application Japan, Jun. 13, 1986, 61-138731

Int. Cl.[4] G01L *9/04*

U.S. Cl. 73—726 **8 Claims**



1. A semiconductor pressure sensor comprising:

a metal diaphragm having a surface roughness of 0.5 μm to 3 μm and which deforms in proportion to a change in an applied pressure;

a metal oxide layer formed in a surface of said metal diaphragm;

a glass layer formed on said metal oxide layer; and

a semiconductor chip having a strain gauge which produces output signals responsive to the deformation of said metal diaphragm, said semiconductor chip being bonded to said glass layers.

5. A semiconductor pressure sensor comprising:

a metal diaphragm which deforms in proportion to a change in an applied pressure;

a metal oxide layer formed in a surface of said metal diaphragm;

a glass layer formed on said metal oxide layer, said glass layer being made of a low melting point glass having a thickness of about 40 μm to 60 μm, and a filler of said glass layer having an average particle diameter of about 2.0 μm and a maximum particle diameter of about 20 μm; and

a semiconductor chip having a strain gauge which produces output signals responsive to the deformation of said metal diaphragm, said semiconductor chip being bonded to said glass layer.

4,840,068

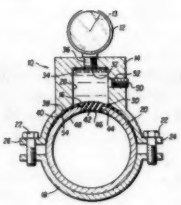
PIPE PRESSURE SENSOR

John D. Mayhew, Jr., 6831 Campbell Dr., Salem, Va. 24153

Filed Mar. 14, 1988, Ser. No. 168,077

Int. Cl.[4] G01L *7/08*

U.S. Cl. 73—730 **4 Claims**



1. A pressure sensor to be mounted on a pipe having a hole therein for measuring the pressure of fluid in the pipe comprising:

a chamber holder for defining a hollow chamber having a pressure inlet opening and a pressure outlet opening;

a pressure gauge attached to said chamber holder and communicating with said hollow chamber through said pressure outlet for measuring the pressure of a fluid in said hollow chamber;

a fluid in said chamber;

a mounting means for engaging a pipe and said chamber holder and mounting said chamber holder on said pipe by urging the pressure-inlet opening of said chamber holder toward said pipe;

a diaphragm comprising a wide flat flange means and a narrower, round, sensing protrusion with a sensing tip on the outer end thereof extending outwardly from one side of the diaphragm, said flange means having the function of being positioned between said chamber holder and an outer surface of said pipe to form a sealed interface between a portion of said chamber holder surrounding said pressure-inlet opening and said pipe, said protrusion extending through said hole in said pipe so as to communicate pressure of fluid in the pipe to the fluid in the chamber via the diaphragm, said sensing protrusion having a length such that when the pressure sensor is mounted on said pipe the sensing tip of said sensing protrusion is positioned approximately at an inner surface of said pipe and a diameter which is approximately the same as the diameter of said hole;

whereby a hole can be bored in said pipe having a diameter of approximately the diameter of said round sensing protrusion, said pressure sensor can be mounted at said hole with said sensing protrusion extending therethrough so that pressure of fluid in said pipe is transmitted to said pressure gauge via said sensing protrusion.

4,840,069

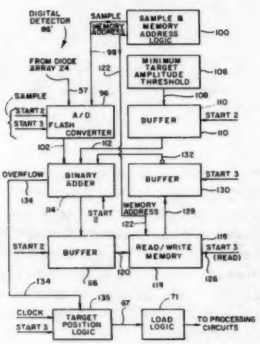
ELECTRO-OPTIC SPACE POSITIONER WITH BACKGROUND COMPENSATOR

Herbert R. Hampton, Hauppauge; Robert Fodale, Massapequa, and Charles R. Conkling, Jr., Shoreham, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 903,366, Sep. 3, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 183,421

Int. Cl.[4] G01M *5/00*

U.S. Cl. 73—802 2 Claims



1. An apparatus for analyzing aircraft wing movement under load, the apparatus comprising:

a plurality of light sources located on an aircraft wing which moves relative to a fuselage;

a diode array mounted on the aircraft fuselage for sensing light from the sources as well as background, and converting sensed light to analog signals corresponding to wing displacement;

analog/digital converting means connected to the diode array output for converting the analog signals to corresponding digital signals after elimination of residual charge in the diode array;

means for storing the digital signals derived from background light alone;

means connected to the output of the storing means for subtracting the digital signals during the two time periods -

(a) non-energization of the light sources when only background light is present,

(b) energization of the light sources when the background light is also present;

whereby the effects of background light are eliminated thereby correlating an output from the diode array solely to the light sources on the wing;

an overflow output of the subtracting means for carrying data representing the location of a sensed light source exceeding a threshold and located relative to a reference point; and

means having an input connected to the overflow output for gating overflow data with a system clock, the latter clock providing system timing for the light sources and the light-sensing array.

4,840,070

LAMINATE COMPRESSION TESTER

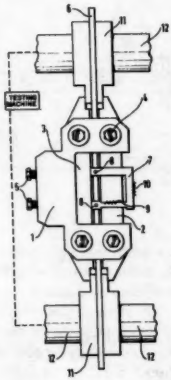
Colin A. Ralfs, and Anthony Murdock, both of Preston, United Kingdom, assignors to British Aerospace Public Limited Company, Preston, England

Filed Oct. 20, 1987, Ser. No. 110,310

Claims priority, application United Kingdom, Oct. 21, 1986, 8625204

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—818 6 Claims



1. A stabiliser assembly for preventing premature failing of an elongate compression test specimen by buckling including:

a support body defining a passage region through which a test specimen is inserted, said support body comprising two generally parallel spaced U-shaped bracket members, the arms of one bracket member being rigidly interconnected by spacer means to the arms of the other bracket member with the bases of said members lying adjacent each other; and

two generally parallel spaced pairs of stabiliser members carried between the arms of said bracket members, said stabiliser members of each pair being mounted in use one to each side of the inserted specimen, each stabiliser member having a longitudinal edge region which lies adjacent a length of the inserted specimen so that, if initial buckling of the inserted specimen occurs, the edge region is contacted by the inserted specimen and further buckling prevented, each stabiliser member being of a cross-sectional shape such that any buckling loads are resisted, at least one of said stabiliser members being adjustable with reference to the other so that test specimens of different thicknesses can be accommodated.

4,840,071

CONVECTIVE ATTENUATION FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 71,777, Jul. 10, 1987, and a continuation-in-part of Ser. No. 78,206, Jul. 27, 1987, and a continuation-in-part of Ser. No. 88,571, Aug. 24, 1987. This application Mar. 3, 1988, Ser. No. 163,855

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 9 Claims

1. An apparatus for measuring mass flow rate comprising in combination:

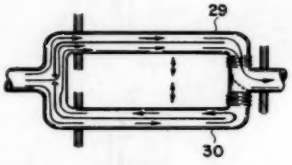
(a) at least one elongated member including at least one flow passage with one extremity secured to a support to restrain lateral movement thereof and the other extremity disposed in a laterally flexible arrangement;

(b) another elongated member including at least two flow passages with one extremity secured to the support to

restrain lateral movement thereof and the other extremity disposed in a laterally flexible arrangement, wherein said two flow passages are connected to one another alowing media to circulate therethrough under zero net flow condition;

(c) means for imposing flexural vibrations on said one and another elongated members;

(d) first means for determining time rate of loss of momentum associated with the flexural vibration of said one elongated member from said one elongated member; and



(e) second means for determining time rate of loss of momentum associated with the flexural vibration of said another elongated member from said another elongated member;

wherein mass flow rate of media moving through said one elongated member is determined from the difference in the time rates of loss of momentum respectively determined by said first and second means for determining the time rate of loss of momentum.

4,840,072

VARIABLE ORIFICE FLOW METER

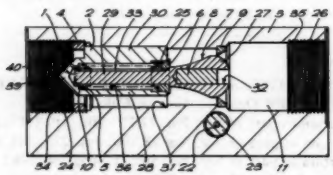
Roy M. Cuthbert, c/o Webtec Products, Ltd., Edison Road, St. Ives, Cambridgeshire, PE17 4LZ, England

Filed Aug. 5, 1987, Ser. No. 81,823

Claims priority, application United Kingdom, Oct. 28, 1986, 8625705

Int. Cl.[4] G01F *1/26*

U.S. Cl. 73—861.58 **9 Claims**



1. A variable orifice flow meter comprising a body, an inlet in the body, an outlet in the body, a bore in the body extending between the inlet and the outlet and defining a straight flow passage for liquid, a sharp edged orifice in the bore, a piston having a head capable of blocking the orifice, support means for the piston mounted in the bore, the support means having a blind bore in which the piston is slidably mounted and resilient means in the support means and arranged to urge the piston to block the orifice.

4,840,073

TORQUE DETECTING DEVICE

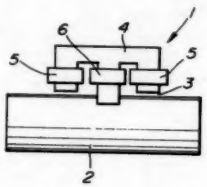
Hiroyuki Aoki, Yokohama; Shinichiro Yahagi, Ohbu, and Takanobu Saito, Tohkai, all of Japan, assignors to Nissan Motor Company Ltd. and Daido Tokushuko Kabushiki Kaisha, both of, Japan

Filed Sep. 25, 1987, Ser. No. 101,213

Claims priority, application Japan, Sep. 26, 1986, 61-226062; Dec. 27, 1986, 61-310685

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **16 Claims**



1. A torque detecting device having a measuring shaft, means for forming a magnetic circuit wherein said measuring shaft is a part of said magnetic circuit, and means for detecting a magnetostrictive force passing through said measuring shaft, wherein said measuring shaft is made from a steel comprised by weight percentage of 0.1–0.5% of C, not more than 1.0% of Si, not more than 2.0% of Mn, and one or both of not more than 5.0% of Ni and not more than 5.0% of Cr, with the remainder being iron and impurities.

4,840,074

MULTI-STREAM FLUID SAMPLING VALVE

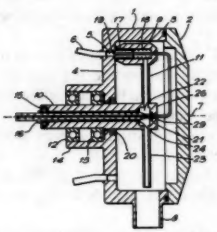
Paul A. Jessop, Northwich, England, assignor to VG Instruments Group Limited, Crawley, England

Filed Mar. 31, 1988, Ser. No. 175,847

Claims priority, application United Kingdom, Apr. 2, 1987, 8707874

Int. Cl.[4] G01N *1/00*

U.S. Cl. 73—864.81 **20 Claims**



1. A valve for providing a sample from any of a plurality of streams of fluid (,) comprising:

a) movable selecting means for selecting one of said plurality of streams while allowing the unselected ones of said streams to discharge;

b) sample dividing means for dividing the selected one of said streams into a sample flow portion and a purging flow portion;

c) a stationary output member;

d) a transfer member movable with said selecting means and adapted to convey said sample flow portion from said selecting means to said stationary output member;

e) sealing means for connecting said transfer member to said

output member and adapted to confine substantially all of said sample flow portion to its interior;

f) a movable seal housing in which said sealing means is disposed and in which is formed a purging chamber adjacent to at least a part of the exterior of said sealing means, and

g) means for passing said purging flow portion through said purging chamber.

4,840,075

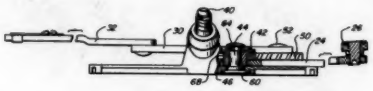
WINDOW OPERATOR

Daniel G. Tucker, Elysian, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed May 20, 1988, Ser. No. 196,378

Int. Cl.[4] F16H *29/20*

U.S. Cl. 74—89.14 **4 Claims**



1. A window operator comprising a base, a pivot pin upstanding from said base, a bushing mounted on said pivot pin, a first member pivotally mounted on said bushing, a second member pivotally mounted on said bushing, said members being superimposed one on the other with the bushing having an end extending thereabove, a metal washer positioned against said bushing end and extending radially therebeyond to have an annular part thereof overlie part of the uppermost member, and said annular part of the washer being deformed downwardly from the plane of the washer a predetermined amount to provide a controlled clearance for the members.

4,840,076

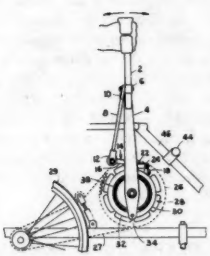
LEVER DRIVE APPARATUS

Clifford E. Brubaker, and Colin A. McLaurin, both of Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 877,502, Jun. 23, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 161,384

Int. Cl.[4] F16H *37/02*

U.S. Cl. 74—143 **14 Claims**



1. Apparatus for propelling a wheeled vehicle, comprising:

a hand-manipulated lever having an upper portion pivotally connected to a lower portion,

a clutch assembly comprising drum means rotatably connected to the vehicle, brake band means pivotally connected at a lower end to the lower portion of the lever and overlying a circumferential edge of the drum, the brake band means and drum comprising a clutch operable by frictional engagement between the brake band means and the drum,

linkage means connected to an upper end of the brake band means, and

actuator means, connected at one end to the upper portion of the lever and at other end to the linkage means, for actuating the clutch through the linkage means.

4,840,077

BALL SCREW APPARATUS

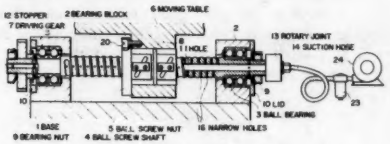
Masayuki Katahira, Maebashi, Japan, assignor to Nippon Seiko Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,226

Claims priority, application Japan, Mar. 25, 1987, 62-43782[U]

Int. Cl.[4] F16H *25/22, 25/24*

U.S. Cl. 74—424.8 NA **7 Claims**



1. A ball screw apparatus including a ball screw shaft having a spiral groove on the outer surface thereof, a ball screw nut having a spiral groove on the inner surface thereof opposing the spiral groove of said shaft, and a plurality of balls which are engaged within the spiral grooves of said ball screw nut and of said ball screw shaft wherein said ball screw shaft has an axial hollow portion, and a plurality of smaller holes open on the outer periphery of said screw shaft, said smaller holes being communicated with said axial hollow portion, and air sucking means comprising a suction port connected to the axial hollow portion of said shaft so as to apply a negative pressure to the inside of the axial hollow portion.

4,840,078

STEERING DEVICE FOR VEHICLES

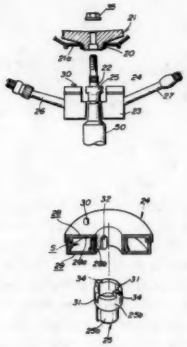
Kazuaki Shitanoki, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1987, Ser. No. 35,350

Claims priority, application Japan, Apr. 7, 1986, 61-51677

Int. Cl.[4] G05G *11/00*

U.S. Cl. 74—484 R **9 Claims**



1. A steering device for a vehicle, comprising:

steering column members fixed to a body of the vehicle;

a steering shaft rotatably mounted on the steering column members;

a steering wheel fixedly connected to an upper end of said steering shaft, said steering wheel having a cylindrical boss member provided with first and second engaged means;

a receiving case member disposed coaxially with said steering shaft, said receiving case member being provided with first and third engaging means, and said receiving case member being rotatable together with said steering wheel by an engagement of said first engaging means and said first engaged means of said steering wheel; and

a cancelling cam member disposed coaxially with respect to said steering shaft, said cancelling cam member being provided with a second engaging means that is engageable with said second engaged means formed in said boss member of said steering wheel and with a third engaged means that is engageable with said third engaging means formed in said receiving case member whereby said cancelling cam member is rotatable together with said steering wheel by the engagement between said second engaged means and said second engaging means and the engagement between said third engaged means and said third engaging means.

4,840,079

PUSH-PULL CONTROL, E.G., A HAND THROTTLE OR STOP CONTROL FOR INTERNAL COMBUSTION ENGINES

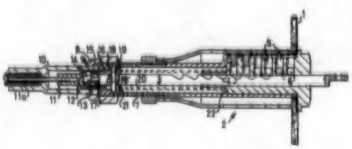
Ingmar Nilsson, Askim, Sweden, assignor to TX Controls AB, Vastra Frolunda, Sweden

Filed Nov. 16, 1987, Ser. No. 121,142

Claims priority, application Sweden, Nov. 18, 1986, 8604929

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—500.5 **4 Claims**



1. Control device comprising a housing, a push-pull rod displaceably mounted in the housing and having a longitudinal axis, and a connector element for connecting an operating element to the push-pull rod, the connector element and the push-pull rod having profiled interfitting end portions which can be coupled together by an engagement movement perpendicular to said longitudinal axis, characterized in that the push-pull rod is surrounded by a sleeve element, which is limitedly displaceable relative to the push-pull rod and is springloaded towards an end position, in which the sleeve element engages the connector element and prevents the connector element from moving relative to the push-pull rod in a direction perpendicular to said longitudinal axis.

4,840,080

DRIVING DEVICE EMPLOYED IN A WINDOW REGULATOR

Tetuo Kobayashi, Ikeda, and Shoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System, Inc., Takarazuka, Japan

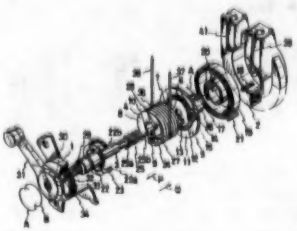
Continuation of Ser. No. 906,360, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 669,493, Nov. 8, 1984, Pat. No. 4,628,759. This application Apr. 7, 1988, Ser. No. 180,646

Claims priority, application Japan, Feb. 21, 1984, 59-24043; Feb. 21, 1984, 59-32024

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501.5 R **6 Claims**



1. A driving device employed in a window regulator comprising:

(a) housing;

(b) a driving member including a shaft provided for rotational movement within said housing and an associating member being fixed to said shaft, said associating member extending from said shaft in the radial direction and having at least one notch portion along a peripheral edge of said associating member;

(c) a drum being provided within said housing, being adjacent to said associating member, being coaxial with said shaft, being rotatable around said shaft, being axially movable along said shaft and having an associating projection, said associating projection being mounted on a first side surface of said drum facing to said associating member, and being capable of associating said notch portion with some play in the rotational direction;

(d) an elastic means for urging said associating member in the rotational direction and for biasing said drum away from said associating member, by engagement of one end of said elastic means with said drum and by engagement of the other end of said elastic means with said associating member; and

(e) a brake spring set between an outer peripheral surface of said associating member and an inner peripheral surface of said housing having ends inserted into gaps between said notch portion and said associating projection.

4,840,081

SPEED-CHANGE OPERATING LEVER FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 11, 1988, Ser. No. 155,155

Claims priority, application Japan, Feb. 18, 1987, 62-23314[U]

Int. Cl.[4] F16C *1/10*; G05G *11/00*

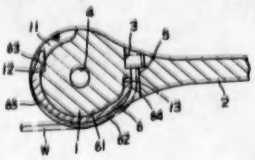
U.S. Cl. 74—502.2 **6 Claims**

1. A speed-change operating lever for a bicycle for operating a derailleur through a control wire interconnecting the derailleur and the operating lever to change the bicycle speed, said lever comprising:

a boss provided with a winding portion for receiving said control wire,

an operating portion in continuation of said boss and extending radially outwardly of said boss, and

a wire retaining portion for retaining an end of said control wire, said winding portion being provided with a winding amount changing means for adjusting an outer diameter of said winding portion with respect to a center of said boss



to change an amount by which said wire is wound at said winding portion, said winding amount changing means comprising a winding adjuster having a substantially circular arc shape and being detachably mounted on said winding portion and having a winding part on its outer side surface on which said wire is wound.

4,840,082

LEVER SYSTEM FOR VEHICLES

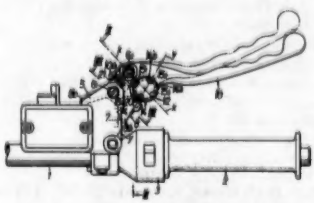
Hideyuki Terashima, and Yasuhiko Tsuchiya, both of Ueda, Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Jun. 2, 1988, Ser. No. 201,239

Claims priority, application Japan, Jun. 5, 1987, 140780; Jun. 5, 1987, 87422[U]

Int. Cl.[4] G05G *1/04*

U.S. Cl. 74—523 5 Claims



1. A lever system for vehicles, comprising an operating element for operating a master cylinder, an operating lever for actuating said operating element, said operating element and said operating lever being mounted on a lever holder attached to a steering handle, and an adjusting means interposed between said operating element and said operating lever for adjusting the distance between said operating lever and said steering handle, wherein said operating element is pivotally supported on said lever holder through a first support shaft, and said operating lever is pivotally supported on said operating element through a second support shaft; wherein said adjusting means comprises an adjusting element rotatably mounted in said operating lever and having a plurality of recesses of different depths made therein, a pin hole made in said operating element, and an urging pin having its one end fitted in said pin hole and having the other end adapted to be selectively engaged in one of said plurality of recesses.

4,840,083

DEVICE FOR DAMPENING ROTARY MOTION

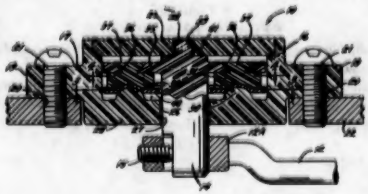
Robert A. Hagan, Roscoe, and Ernest W. Reinwall, McHenry, both of Ill., assignors to Eleo Industries, Inc., Rockford, Ill.

Filed Mar. 14, 1988, Ser. No. 167,700

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[4] F16F *15/10*

U.S. Cl. 74—574 11 Claims



1. Apparatus for dampening rotation of a first member relative to a second member, said second member comprising a chamber having an axially facing wall, angularly spaced protrusions projecting from said wall and extending axially into said chamber, said first member comprising a rotatable shaft and further comprising a disc joined rigidly to and projecting radially from said shaft and rotatable in said chamber, an elastomeric ring coupled to and rotatable with said disc, said ring being located on one face of said disc and being disposed between said disc and said protrusions, and means pressing said ring toward said protrusions with sufficient force to cause said ring to be resiliently compressed by said protrusions, the compression of said ring creating a force against said protrusions as said ring rotates relative to said protrusions whereby such force dampens rotation of said first member relative to said second member.

4,840,084

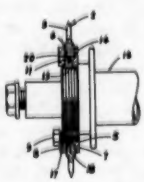
FREEWHEEL MECHANISM FOR BICYCLES

Roger O. Durham, 1370 Thompson Ave., Glendale, Calif. 91201

Filed Dec. 17, 1987, Ser. No. 134,502

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—594.1 5 Claims



1. In combination with a bicycle having a roller chain and having a rotatable rear wheel including a hub having an externally-threaded shoulder, a freewheel mechanism comprising:

(a) a freewheel body having internal threads for engagement with said threaded shoulder of said hub, said freewheel body including a cylindrical shoulder and a head portion;

(b) a removable side plate secured to said freewheel body;

(c) a sprocket rotatably supported on said cylindrical shoulder of said freewheel body, said sprocket having sprocket teeth for engagement with said roller chain, said sprocket nested for guidance between said head portion of said freewheel body and said removable side plate;

(d) a pawl means and pawl spring means disposed between said sprocket and said freewheel body, said pawl means and said pawl spring means coacting with said sprocket

and said freewheel body, so as to allow said sprocket to turn in only one direction in relation to said freewheel body.

4,840,085

PEDAL FOR A BICYCLE

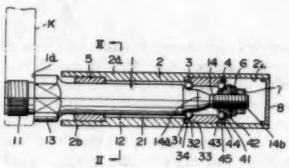
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 3,412, Jan. 15, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 206,947

Claims priority, application Japan, Jan. 23, 1986, 61-8290[U]

Int. Cl.[4] G05G 1/14

U.S. Cl. 74—594.4 **4 Claims**



1. A bicycle pedal to be supported to a crank arm of a bicycle, comprising:

(a) a pedal shaft including a base adapted to be mounted on said crank arm, an utmost end portion, and an intermediate shaft portion between said base and said utmost end portion, said utmost end portion having a smaller diameter than a diameter of said base,

(b) a pedal body suported rotatably relative to said pedal shaft, said pedal body having a first foot bearing surface on one side thereof and a second foot bearing surface at another side thereof which are positioned radially outwardly of said intermediate shaft portion and said outmost end portion,

(c) a ball bearing means for supporting said pedal body rotatably relative to said pedal shaft and comprising a first ball bearing means and a second ball bearing means provided between said pedal body and said utmost end portion at a position located at said utmost end portion spaced from an axial center position of a portion of said pedal shaft which includes said intermediate shaft portion and said utmost end portion, said first ball bearing means and said second ball bearing means being axially spaced apart and located at a position adjacent a longitudinal utmost end portion of said pedal body; and

(d) a bush formed of light metal or synthetic resin and provided between a longitudinal root end portion of said pedal body and said intermediate shaft portion at a side of said intermediate shaft portion adjacent said base, said bush comprising means for enabling said pedal body at a side thereof adjacent said base to be supported through said bush which in turn is supported by said pedal shaft when said pedal body bends radially of said pedal shaft, wherein a gap is defined between said pedal body and said intermediate shaft portion, said gap enabling said pedal body to rotate freely relative to said pedal shaft during use without contacting said pedal shaft when said pedal body bends radially of said pedal shaft responsive to a treading force applied to one of said first foot bearing surface and said second foot bearing surface, said bush having a length such that it does not extend into said gap.

4,840,086

DEVICE FOR FASTENING A SHOE ON A BICYCLE PEDAL

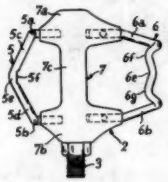
René M. R. Bidal, Labalme Sur Cerdon, France, assignor to Ste Look, Nevers, France

Filed May 13, 1988, Ser. No. 193,722

Claims priority, application France, Jun. 22, 1987, 87 08730

Int. Cl.[4] G05G 1/14

U.S. Cl. 74—594.6 **8 Claims**



1. A device for fastening a shoe to a bicycle pedal, which comprises in combination:

at least one retaining member attached to the underface of the sole of the shoe, said retaining member being provided with a rear retaining recess which opens rearwardly and with a front retaining recess which opens forwardly,

a bicycle pedal comprising a pedal body having a spindle and carrying a rear anchoring member and a front anchoring member, said anchoring members being adapted for respectively being engaged inside said rear and front retaining recesses of said retaining member attached to the underface of said sole of the shoe,

each of said anchoring members being formed of a length of resilient metal wire,

said metal wire forming the rear anchoring member comprising two horizontal arms joined to one another so as to define between said arms an obtuse angle which faces said pedal,

said metal wire forming said front anchoring member comprising a horizontal transverse arm spaced from and attached to said pedal by two rearwardly extending portions of said metal wire, a slight kink being formed between said rearwardly extending portions in a central portion of said transverse arm,

said kink capable of engaging said front retaining recess of said retaining member atached to the sole of said shoe, while the apex of said obtuse angle of said rear anchoring member is engaged inside said rear retaining recess of said retaining member.

4,840,087

DIFFERENTIAL GEAR ASSEMBLY INCLUDING AT LEAST ONE INTEGRATED CONSTANT VELOCITY UNIVERSAL JOINT

Hans-Heinrich Welschof, Rodenbach, and Rudolf Beier, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 7, 1986, Ser. No. 916,304

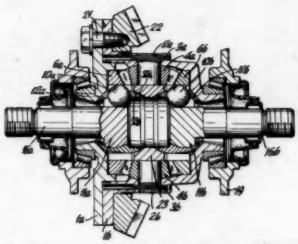
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536289

Int. Cl.[4] F16H 1/40

U.S. Cl. 74—713 **18 Claims**

1. A differential gear assembly comprising: a differential gear housing; differential gear means; at least one constant velocity universal joint integrated within said gear housing, said universal joint including an inner joint member, an outer joint member, ball means joining said inner and outer joint members in torque transmitting engagement and shaft journal means engaging said inner joint member; and means for engaging said outer joint member with said differential gear means; wherein said inner joint member, said ball means and said shaft

journal means of said universal joint positioned inside said housing are provided with at least one sliding face, said one sliding face being supported by one of an inwardly directed support and an outwardly directed support, said inwardly directed support being located axially inwardly in said housing relative to said joint and said outwardly directed support being



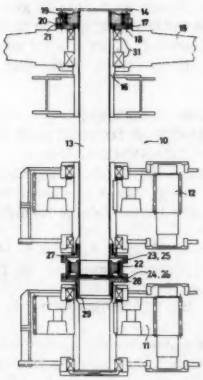
on a counter face designed independently of said outer joint member; wherein one of said inner joint member and said shaft journal means is supported in the direction of a center of said differential gear assembly axially on sliding faces of a ring member which is held in a differential carrier and which is independent of said outer joint member.

4,840,088

MECHANICAL TRANSMISSION, PARTICULARLY FOR CABLEWAY WINCHES

Otto Pabst, Meransen, Italy, assignor to Leitner, S.p.A., Bolzano, Italy

Continuation-in-part of Ser. No. 24,008, Mar. 10, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 229,723
Claims priority, application Italy, Mar. 11, 1986, 21190/86[U]
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—661 **1 Claim**



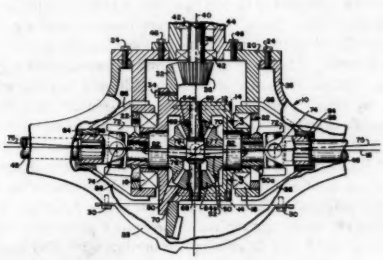
1. A mechanical transmission comprising:
(a) a shaft having a first end and a second end;
(b) a first flange mounted on the first end of said shaft;
(c) a first articulated coupling mounted on said shaft adjacent to said first flange, said first coupling having frontal teeth facing away from said first flange;
(d) first means for releasably coupling said first articulated coupling to said first flange;
(e) a pulley mounted on said shaft adjacent to said first articulated coupling, said pulley being mounted for free rotation relative to said shaft;
(f) a second flange mounted on said shaft between said pulley and said first articulated coupling, said second flange having frontal teeth facing said first articulated coupling and sized, shaped, and positioned to engage said teeth on said first articulated coupling;
(g) second means for releasably coupling said second flange to said pulley;
(h) a first speed reduction gear assembly mounted on said shaft adjacent said pulley;
(i) a second speed reduction gear assembly mounted on the second end of said shaft, said second speed reduction gear assembly having a longitudinal seat facing said first speed reduction gear assembly, said longitudinal seat having internal longitudinal splines;
(j) a first sleeve mounted on said shaft and connected to said first speed reduction gear assembly on the side facing said second speed reduction gear assembly, said first sleeve having frontal teeth facing away from said first speed reduction gear assembly;
(k) a second sleeve slidably mounted on said shaft and releasably connected to said second speed reduction gear assembly on the side facing said first speed reduction gear assembly, said second sleeve having frontal teeth facing away from said second speed reduction gear assembly and having external longitudinal splines sized, shaped, and positioned to engage said internal longitudinal splines in said seat;
(l) a second articulated coupling mounted on said shaft between said first and second sleeves, said second articulated coupling having frontal teeth facing said first sleeve and sized, shaped, and positioned to engage said teeth on said first sleeve and frontal teeth facing said second sleeve and sized, shaped, and positioned to engage said teeth on said second sleeve;
(m) third means for releasably connecting said first sleeve to said second articulated coupling;
(n) fourth means for releasably connecting said second sleeve to said second articulated coupling; and
(o) said second sleeve being sized and shaped so that, when it is released from said second articulated coupling, it can slide into said longitudinal seat and out of engagement with said second articulated coupling.

4,840,089

AXLE-CONTROLLED, POSITIVE DIFFERENTIAL

Archie O. Williamson, Edina, Minn., assignor to Williamson Patent Holding Company, Edina, Minn.

Filed May 16, 1988, Ser. No. 194,446
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—690 **29 Claims**



25. A positive differential, comprising:
a case supported for rotation about a transverse axis;
drive means for effecting rotation of said case;
a pair of rotatable bevels positioned within said case;
control means for supporting said bevels in spaced-apart,

opposing predetermined angled relation in said case for separate rotation about offset axes extending through points positioned predetermined equal distances laterally outward along the transverse axis toward the respective output shafts and through a common focal point positioned a predetermined distance off the transverse axis, as well as for common rotation about the transverse axis, but while constraining said bevels against uncontrolled revolution about the transverse axis relative to said case, so that spacing between said bevels varies between a predetermined minimum and a predetermined maximum in accordance with circumferential position;

a universal joint coupled between each bevel and a corresponding output shaft;

means for rotatably supporting each universal joint in fixed position relative to said case; and

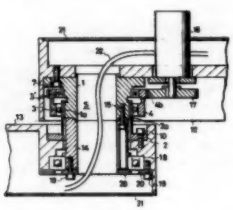
a first pinion rotatably supported on said case and engaged between said bevels at the maximum spacing therebetween so that said pinion permits relative rotation of said bevels for differential drive.

4,840,090

HARMONIC SPEED CHANGER

Masanari Iwata, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 19, 1988, Ser. No. 145,088
Claims priority, application Japan, Jan. 19, 1987, 62-9256
Int. Cl.[4] F16H *37/00*
U.S. Cl. 74—804 **7 Claims**



1. A harmonic speed changing mechanism arranged in an articulation between a first arm and a second arm of an industrial robot such that the second arm is supported through said harmonic speed changing mechanism swingably by the articulation, said mechanism comprising:

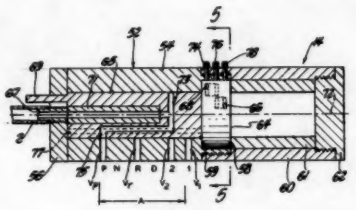
a circular spline fixed to said first arm of said articulation and having a cylindrical outer surface formed with a gear, a flexible spline fixed to said second arm of said articulation and having a cylindrical inner surface formed with a gear, the number of teeth of said gear of said flexible spline being larger than that of said gear of said circular spline, said flexible spline being arranged outside of said circular spline so that said gear of said circular spline can mesh with said gear of said flexible spline, and a wave generator having an inner surface defining an ellipsoidal cross section, said gear of said flexible spline being deformed to an ellipse by said inner surface of said wave generator so that said gear of said flexible spline meshes with said gear of said circular spline partially to thereby rotate said flexible spline and said second arm of said articulation at a predetermined reduction rate when said wave generator is rotated, wherein a through-hole is formed along an axis of said harmonic reduction gear mechanism and wiring and/or piping necessary for said industrial robot is provided in said through-hole.

4,840,091

TRANSMISSION SHIFT MECHANISM

Roger R. Smith, 7261 Lyons Rd., Imlay City, Mich. 48444

Filed Oct. 11, 1988, Ser. No. 255,800
Int. Cl.[4] F16H *5/52*; B60K *41/22*
U.S. Cl. 74—867 **17 Claims**



1. A mechanism for selecting the gear of an automatic transmission in a vehicle, comprising:

a pressure source;

a gear selection valve having an inlet means for receiving fluid from the pressure source, first outlet ports, and second outlet ports;

a manual override means for opening and blocking communication between the pressure source and the first ports and for simultaneously opening and blocking communication between the pressure source and the second outlet ports;

a port selector means within the valve for controlling flow through the second ports, the port selector means being movable to a plurality of positions, each position permitting a selected second outlet port to open;

a selector control means for moving the port selector means from one position to another, the selector control means including a planetary gear set connected by an input shaft to the transmission and connected to a vehicle load by an output shaft, the planetary gear set having a ring gear whose angular position is a function of reaction torque imposed by the load on the output shaft, the selector control means further including an arm assembly connected between the ring gear and the port selector means so that the position of the port selector means is a function of the reaction torque on the output shaft.

4,840,092

HYDRAULIC CONTROL DEVICE FOR AUTOMATIC TRANSMISSIONS

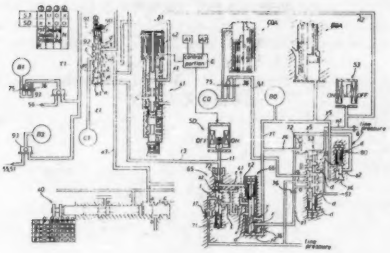
Yoshikazu Sakaguchi, Anjo; Yutaka Taga, Aichi, and Yuji Kashihara, Toyota, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 25, 1987, Ser. No. 67,764
Claims priority, application Japan, Jun. 30, 1986, 61-154834; Jun. 30, 1986, 61-154835
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—869 **15 Claims**

1. A hydraulic control device for an automatic transmission, including a control unit, a shift gear mechanism, clutches and brakes for controlling the shift gear mechanism, hydraulic servos for actuating the clutches and brakes to control the shift gear mechanism and having hydraulic servo for a forward clutch, and an electronically operated regulating valve for regulating pressure according to signals from the control unit, comprising:

a selecting valve switched by signals indicating stopping and running condition of a vehicle, said selecting valve being connected to the hydraulic servo for the forward clutch for engaging and transmitting torque during the forward running condition, said selecting valve selectively receiving a line pressure and a control pressure from said regu-

lating valve so that hydraulic pressure just below engaging pressure regulated by said regulating valve is applied



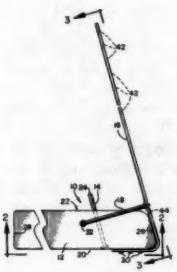
to said hydraulic servo for the forward clutch during stopping, and a line pressure is applied to said hydraulic servo for the forward clutch during running.

4,840,093

LID LOOSENER AND TIGHTENER

Leman Goldman, Jr., 2644 Rockafellow Ave., Pennsauken, N.J. 08109

Filed Dec. 16, 1987, Ser. No. 133,651
Int. Cl.[4] B67B 7/18
U.S. Cl. 81—3.43 **6 Claims**



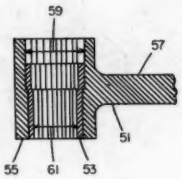
1. A device for loosening and tightening the lids of jars or containers, said device comprising a handle, a flexible strap, a means for attaching said strap to said handle, a means for forming a loop in said strap sized to be placed around said lid, a means for securing said strap to said handle after said strap has been wrapped around said lid, said handle comprising a top and a bottom, said strap comprising a wide section and a narrow section, said means for attaching said strap to said handle comprising tacks wich attach said wide section to said bottom of said handle, said means for forming said loop comprising a brace attached to said handle and a slot positioned in said wide section, and said strap further comprising an unattached end so that said loop may be formed by placing said unattached end through said brace and inserting said unattached end through said slot.

4,840,094

MULTIPLE SOCKET AND MULTIPLE SOCKET WRENCH

Richard J. Macor, 13H Franklin Greens, Somerset, N.J. 08873

Continuation-in-part of Ser. No. 468,779, Feb. 22, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,321
Int. Cl.[4] B25B 13/58
U.S. Cl. 81—185 **30 Claims**



1. A multiple socket device having four different conventional socket sizes about a single axis, comprising:

(a) a first member being an outer member and having a generally hollow, cylindrical configuration about said single axis, said first member having an upper portion and a lower portion, the upper portion having a first inside diameter corresponding to the largest of said four different conventional socket sizes, and the lower portion having a second inside diameter corresponding to the second largest of said four different conventional socket sizes, each of said upper portion and said lower portion having an array of angular longitudinal grooves spaced around its inside surface and extending for the entire length thereof;

(b) a second member being an inner member and having a generally hollow, cylindrical configuration, about said single axis, said second member having an upper portion and a lower portion, the upper portion having an outside diameter substantially equal to the inner diameter of the upper portion of said first member and having an array of angular longitudinal grooves spaced around its outside surface corresponding to those on the inside surface of said upper portion of said first member, said upper portion further having a third inside diameter corresponding to the second smallest of said four different conventional socket sizes and having an array of angular longitudinal grooves spaced around its inside surface and extending for the entire length thereof, the lower portion having an outside diameter substantially equal to the inner diameter of the lower portion of said first member and having an array of angular longitudinal grooves spaced around its outside surface corresponding to those of the inside surface of said lower portion of said first member, said lower portion further having a fourth inside diameter corresponding to the smallest of said four different conventional socket sizes and having an array of angular longitudinal grooves spaced around its inner surface and extending for the entire length thereof, said second member being slidably mounted within said first member along said single axis and being releasably fixed so as to move axially within said first member between two fixed positions without protruding from said first member.

4,840,095

TURNING MACHINE

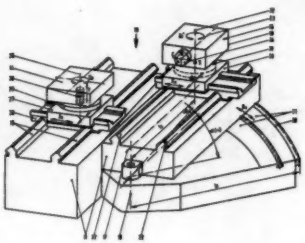
Walter Nussbaumer, and Karl-Heinz Beyrer, both of Ravenburg, Fed. Rep. of Germany, assignors to Maschinenfabrik Ravensburg AG, Ravensburg, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 60,076

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3618938

Int. Cl.[4] B23B *3/00*

U.S. Cl. 82—117 13 Claims



1. A universal turning machine comprising:

a multi-track bed having first tracks and second tracks disposed substantially side-by-side with said first tracks, said multi-track bed comprising a spindle head machine bed having said first tracks thereon, said first tracks extending in a longitudinal direction in a bed plane;

a spindle head having means for mounting a workpiece thereon, including a headstock means and a receiver means, rotatively mounted to said headstock means, for rotatively supporting a workpiece for rotation about a receiver axis, and having a center axis perpendicular to said bed plane, said spindle head being mounted on said first tracks for movement thereon in said longitudinal direction;

indexing control means for controlling the angle of said receiver means about said receiver axis;

an auxiliary machine bed having said second tracks thereon;

a rest for mounting thereon working means which work the workpiece on said spindle head during rotation of the workpiece by said receiver means, said rest being mounted on said second tracks for movement therealong in opposite first directions, said spindle head machine bed and said spindle head therewith being pivotable in said bed plane about at least a swivel axis for adjusting the relative positions of the working means and the workpiece prior to working the workpiece with the working means, said swivel axis being perpendicular to said bed plane and parallel to and spaced from said center axis, said spindle head on said first tracks and said rest on said second tracks being movable past each other respectively in said longitudinal and first directions; and

means for supporting said rest on said second tracks such that said rest is movable in second directions transverse to said first directions, said first and second directions being parallel to said bed plane;

said spindle head being moveable on said first tracks and in pivotal movement with said spindle head machine bed in said bed plane about said swivel axis and said rest being movable in said first and second directions, all during rotation of the workpiece by said receiver means with the working means engaging the workpiece so as to work the workpiece, said spindle head being movable on said first tracks to a position where said swivel axis is spaced from said center axis a distance between approximately 100 cm and approximately 300 cm.

4,840,096

DEVICE FOR MACHINING CHAMFERS ON A FREE OF A PIPE

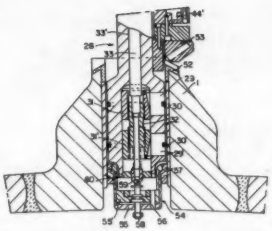
Alain Martin, Lyons, and Philippe Maillard, Marcy l'Etoile, both of France, assignors to Framatome & Cie., Courbevoie, France

Division of Ser. No. 709,270, Mar. 7, 1985. This application Apr. 16, 1987, Ser. No. 39,201

Claims priority, application France, Mar. 8, 1984, 8403581

Int. Cl.[4] B23B *5/16*

U.S. Cl. 82—113 2 Claims



1. Device for machining chamfers on a free end of a pipe having a longitudinal axis of symmetry, said device comprising

(a) a frame having means for centering and fixing it in the interior of said pipe coaxially with said pipe, comprising a stem extending along the axis of symmetry when the frame is fixed in the said pipe and having an end exterior to the pipe;

(b) a support for a chamfering tool mounted concentrically around said frame and movable with respect to said frame along an axis of said frame in translation and about said axis of said frame in rotation;

(c) powered drive means mounted on said frame and engaging said support for causing the translation of said support along said axis of said frame;

(d) powered drive means mounted on said frame and engaging said support for turning said support about said axis of said frame;

(e) means for detecting the position and fixing a convenient position of said frame along an axis of said pipe before a chamfering operation, said means comprising a displacement detector cooperating with the extension endn part of the stem of the frame; and

(f) a displacement detector cooperating with a part of the support of the chamfering tool for detecting the position of said support along said axis of said frame and controlling said drive means for causing the translation of said support and said tool along said axis of said frame.

4,840,097

PORTABLE MITER GUIDE DEVICE FOR PORTABLE POWER SAWS

Erwin D. Campbell, 10 Capewood Dr., #180, Simpsonville, S.C. 29681

Filed Aug. 17, 1987, Ser. No. 85,936

Int. Cl.[4] B26D *1/18*

U.S. Cl. 83—829 20 Claims

1. A portable miter guide device for a portable power saw, comprising:

(a) a saw support and guide comprising:

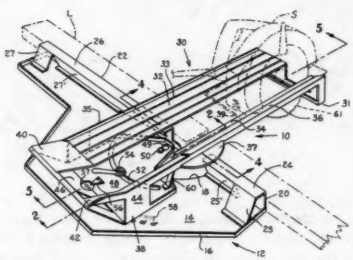
(1) two spaced horizontal elongated members on which a base of said saw is directly supported and guided during saw operation; said horizontal elongated members adapted to extend over the upper surface of lumber to be cut and to guide the blade of said power saw in a straight line between said elongated members;

(2) vertical means for connecting the ends of said horizon-

tal elongated members to maintain the spacing therebetween constant;

(3) a saw support and guide housing having a horizontal support surface spaced from said horizontal elongated members and connected thereto by a plurality of walls extending at an angle from said horizontal elongated members and said horizontal support surface; and

(4) at least one saw lift surface at one end of said horizontal elongated members which extends upwardly from said horizontal elongated members at an angle of less than 90 degrees by which said saw base is directly engaged to lift and guide said power saw out of contact with said support and guide housing during movement of said power saw onto said elongated members for saw operation;



(b) a support base having a horizontal surface for supporting said saw support and guide having spaced vertical surfaces extending at a substantially right angle to the horizontal surface of said base for contact with said lumber;

(c) means for pivotally connecting said saw support and guide housing horizontal support surface to said base horizontal support surfaces for pivotal movement relative thereto; and

(d) means for temporarily locking said horizontal support surfaces in a plurality of angular positions, whereby said elongated members may guide said power saw acros said lumber in one of a plurality of straight line positions at an angle to the side of said lumber.

4,840,098

CUTTING KNIFE FOR ROTARY CUTTING APPARATUS FOR PAPER

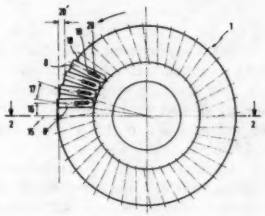
Gunter Gämmerler, Ichoring 44, D-8021 Icking, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,213

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719721

Int. Cl.[4] B26D *1/143*

U.S. Cl. 83—841 **8 Claims**



1. A cutting knife for a rotary cutting apparatus for paper products, comprising a circular-periphery base body having a cutting plane surface on one side and a truncated cone surface on the opposite side; a plurality of blades respectively mounted on said truncated cone surface, each of said blades being adjustably positionalbe to extend beyond said circular periphery and having a blade face in alignment with said base body cutting plane surface.

4,840,099

ELECTRONIC MUSICAL INSTRUMENT

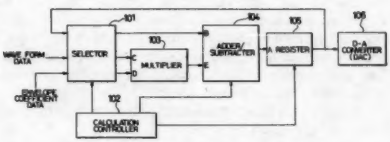
Hiroshi Kitagawa, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Sep. 29, 1987, Ser. No. 102,408

Claims priority, application Japan, Oct. 4, 1986, 61-236862

Int. Cl.[4] G10H *1/00, 1/02, 1/06*

U.S. Cl. 84—1.01 **4 Claims**



1. An electronic musical instrument comprising:

multiplying means for multipling input data C and input data D to obtain output data E;

adding means for adding the output data E and input data B, or substracting them one from the other, to obtain output data A;

memory means for temporarily storing the output data A to be read out later;

selector means which receives the output data A, waveform data and envelope coefficient data and selectively outputs the input data B, C and D;

calculation control means whereby, for a calculation A $=B+(C\times D)$, an envelope calculation represented by

(1) $X=Env-Env\times Step$,

(2) $Env=X+Step\times Speed$,

wherein X represents a buffer for calculation, Step represents envelope level coefficient data, Speed represents envelope speed coefficient data and Env represent envelope data, and an envelope-appended musical waveform calculation represented by

(3) $S=S+Wave\times Env$,

wherein S represents a composite waveform in each channel and wave represents waveform data, are switched between the envelope calculation and the envelope appended musical waveform calculation them on a time-shared basis for each step of each calculation cycle; and

D/A converting means whereby digital musical waveform data obtained by the calculations is converted to analog form for acoustic output;

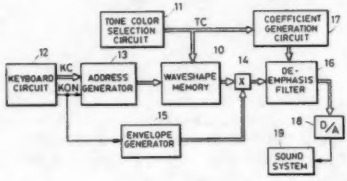
wherein the calculation $A=B\pm C\times D$, is performed on a time-shared basis and the input data is controlled, by which calculations of different functions such as calculations of an envelope waveform and a musical waveform, are performed by the same calculation means, obtaining a musical waveform.

4,840,100

TONE SIGNAL GENERATION DEVICE FOR AN ELECTRIC MUSICAL INSTRUMENT

Takeshi Adachi, and Kazuo Masaki, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 11, 1987, Ser. No. 61,707
Claims priority, application Japan, Jun. 13, 1986, 61-136313
Int. Cl.[4] G01H *1/02, 1/00*
U.S. Cl. 84—1.19 **9 Claims**



1. A tone signal generation device for an electronic musical instrument comprising:

memory means for storing waveshape data representing a tone waveshape having plural periods, the tone waveshape having the level of frequency components constituting said tone waveshape being previously elevated in a predetermined high frequency region corresponding to a frequency region to which quantization noise components of said tone waveshape belong;

reading means for reading out said waveshape data from said memory means; and

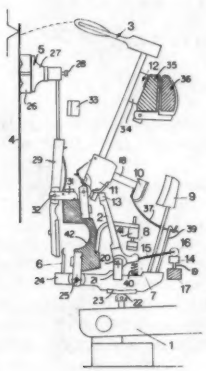
filter means for receiving said tone waveshape and for restraining the level of the components in said predetermined high frequency region, thereby said quantization noise being reduced without impairing the level of the signal component.

4,840,101

ESCAPEMENT MECHANISM FOR UPRIGHT PIANO

Fernand Kummer, Route de Delemont 324, 2802 Develier, Switzerland

Filed Sep. 26, 1988, Ser. No. 248,719
Int. Cl.[4] G10C *3/18*
U.S. Cl. 84—247 **5 Claims**



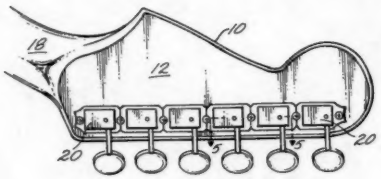
1. An escapement mechanism for an upright piano of the type including a jack pivotally mounted on a movable wippen and provided with a tip at its upper end and a prolongation at its lower end, and a hammer including a butt, the improvement comprising at least one repetition lever carried by the prolongation to define an L-shaped assembly with the jack and prolongation, at least one repetition button disposed below the repetition lever for engagement thereby when the wippen moves outwardly during escapement, thereby causing tilting of the jack so that the tip thereof may be disposed in an original position below the butt.

4,840,102

HIGH DENSITY HEADPLATE FOR A STRINGED INSTRUMENT

R. Aspen Pittman, 13994 Simshaw, Sylmar, Calif. 91342

Filed Mar. 27, 1987, Ser. No. 31,289
Int. Cl.[4] G10D *1/12*
U.S. Cl. 84—293 **9 Claims**



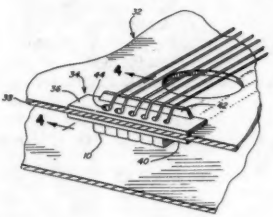
1. In a stringed instrument having a body portion supporting a bridge and a neck terminated with a headstock having a tuning machine including a tuning gear support plate portion affixed thereto, with at least one string stretched between said bridge and said tuning machine: a separate metal headplate having a thickness between 1/64 inch and 1/16 inch and formed of brass and fastened between said headstock and said tuning gear support plate portion of said tuning machine.

4,840,103

STRING LOCK FOR ACOUSTICAL INSTRUMENTS

Todd Mayer, 309 B. Woodcreek Rd., Apt. 215, Bollingbrook, Ill. 60439

Filed Jun. 8, 1987, Ser. No. 59,588
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—297 R **7 Claims**



1. A string retention system for a hollow bodied musical instrument having a soundboard, the improvement comprising:

a bridge including a string support member fixed to the exterior surface of said soundboard;

a reinforcing means fixed to the interior surface of said soundboard beneath said bridge;

a plurality of strings, each string having an appropriate diameter throughout its length and having a restraining means at one end, the diameter of said restraining means being substantially greater than said string length diameter;

a plurality of bores, the number of which equals the number of said plurality of strings, each of said bores being keyhole shaped and extending linearly through said bridge,

said soundboard, and said reinforcing means, the circular portion of said keyhole shape being sufficiently large such that said restraining means can pass therethrough and the notched portion of said keyhole shape having a width larger than said string length diameter and smaller than said restraining means diameter; and

a plurality of string locks, one for each string, each of said string locks consisting of a block having a top surface, a generally parallel bottom surface, and side walls extending between said top and botom surfaces, a bore extending through said block from said top surface to said bottom surface, said bore having a keyhole shape of substantially the same size and shape of each of said plurality of bores, a depression formed in the bottom surface of said string lock approximately over the midpoint of the notch of said string lock keyhole;

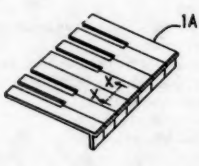
each string lock being positioned interiorly of said hollow body with its bore aligned with an associated one of said plurality of bores, an associated one of said plurality of strings having its restraining means passed through the aligned circular portions of said bores and seated in said string lock depression, thereby extending the adjacent portion of said string length through the notched portion of said aligned bores and over said string support member, whereby the tension of the string provides a compressive force on the combination of elements consisting of said string lock, said reinforcing means, said soundboard, and said bridge which fixes the string in place.

4,840,104

KEYBOARD

Muneo Ishida; Mithuo Yamashita, both of Hamamatsu; Masanari Onishi, Himeji, and Masahiro Tanaka, Hyogo, all of Japan, assignors to Kawai Musical Instrument Manufacturing Co., Ltd., Hamamatsu, Japan

Filed Feb. 5, 1988, Ser. No. 152,532
Claims priority, application Japan, Mar. 3, 1987, 52-47998
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—437 **7 Claims**



1. A keyboard composed of a resin composition, having a durometer hardness of 82 or larger, which comprises a cellulose derivative resin and a silica having 3.0 or less silanol groups in the area of 100 square angstrom and a BET specific surface area of 10 to 210 m^2/g.

4,840,105

MINE FIELD CLEARING APPARATUS

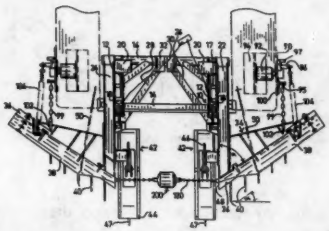
Uri Ladan, Petach Tikva; Boaz Karton, Meitar, and Aron Klipper, Beersheva, all of Israel, assignors to Israel Aircraft Industries Ltd., Lod, Israel

Continuation of Ser. No. 26,387, Mar. 16, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 230,662
Int. Cl.[4] B63G *7/06*; H07F *7/02*; F41H *11/12*
U.S. Cl. 89—1.13 **12 Claims**

1. Apparatus for exploding magnetic mines comprising:

a permanent magnet disposed at a distance in front of a vehicle to be protected from mines and

means for producing rotation of the permanent magnet thereby to cause premature detonation of mines in the



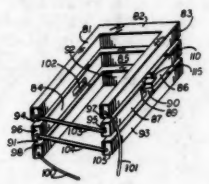
vicinity thereof and without causing unacceptable damage to the vehicle or occupants of the vehicle.

4,840,106

ELECTROMAGNETIC INJECTOR/RAILGUN

Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 910,915, Sep. 22, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 141,365
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **6 Claims**



1. A device for accelerating a projectile comprising:

first and second rails, parallel spaced a predetermined distance apart;

a rigid conductor connecting said first and second rails;

the first said rail having a gap therethrough dimensioned to closely receive said projectile, said gap severing said first rail; and

the second said rail having a hole for admitting said projectile, and

means for applying a voltage across said first and second rails so that presence of said projectile in said gap produces acceleration of said projectile from said gap away from said rails.

4,840,107

METHOD AND APPARATUS FOR MANAGING RECOIL OF ELECTROMAGNETIC GUNS

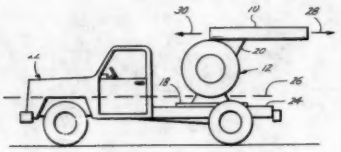
William F. Weldon, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 16, 1987, Ser. No. 39,655
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **7 Claims**

1. A method of distributing recoil force of a railgun, comprising:

establishing a power supply for said railgun, which power supply exhibits a reaction force vector acting on said power supply in a component at the time of power discharge;

coupling said railgun to said power supply such that a railgun recoil force arising as a result of firing of said railgun



will oppose the reaction force vector of the power supply component along the axis of the railgun.

4,840,108

APPARATUS FOR THE INFEED OF AMMUNITION FROM AN AMMUNITION CONTAINER TO AN AUTOMATIC FIRING WEAPON

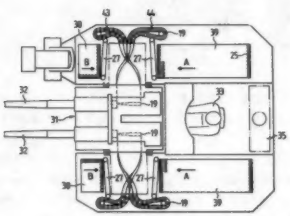
Ernst Hürlemann; Kurt Müller, and Bruno Ruppen, all of Zurich, Switzerland, assignors to Werkzeugmaschinenfabrick Oerlikon-Bührle AG, Zurich, Switzerland

Filed Apr. 21, 1988, Ser. No. 184,608

Claims priority, application Switzerland, May 8, 1987, 01768/87

Int. Cl.[4] F41F *9/02*

U.S. Cl. 89—33.14 **6 Claims**



1. An apparatus for the infeed of ammunition from an ammunition container to an automatic firing weapon, comprising:

an ammunition container;

a plurality of loading clips for ammunition provided for the ammunition container;

each loading clip containing a predetermine number of cartridges;

means mounting said ammunition container for rotation in conjunction with the automatic firing weapon about a predetermine azimuth axis;

a device for displacing the loaded loading clips out of the ammunition container;

an extraction device for stripping the cartridges out of the loading clips;

said extraction device comprising an endless conveyor band which is arranged at an inclination in relation to the loading clips; and

a flexible endless chain which can be twisted through an angle of at least 90° for the transport of the cartridges from the endless conveyor band which have been stripped out of the loading clips to the firing weapon.

4,840,109

APPARATUS FOR DELIVERING AMMUNITION FROM A CONTAINER STRUCTURE TO A FIRING WEAPON

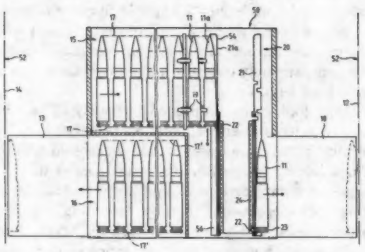
Kurt Müller, Zürich, and Erwin Bohler, Dübendorf, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jan. 25, 1988, Ser. No. 147,876

Claims priority, application Switzerland, Feb. 2, 1987, 362/87

Int. Cl.[4] F41D *10/22*

U.S. Cl. 89—33.14 **4 Claims**



1. An apparatus for delivering ammunition from a container structure to a firing weapon having two spaced weapon barrels, wherein the cartridges in the container structure are arranged side by side as well as one behind the other, comprising:

an ammunition container structure mounted between the two spaced weapon barrels of the firing weapon;

said ammunition container structure comprising a first front ammunition container and a second rear ammunition container viewed in the direction of firing of the two spaced weapon barrels;

said first front ammunition container being operatively associated with one of said two spaced weapon barrels;

said second rear ammunition container being operatively associated with the other one of said two spaced weapon barrels;

a first endless storage chain arranged in said first front ammunition container;

a second endless storage chain arranged in said second rear ammunition container;

said first front ammunition container comprising:

a device for axially displacing cartridges within said first front ammunition container;

a first endless conveyor chain; and

ammunition from said first front ammunition container being delivered by said device for axially displacing cartridges and by said first endless conveyor chain to the associated one of said two spaced weapon barrels;

said second rear ammunition container comprising:

a second endless conveyor chain; and

ammunition from said second rear ammunition container being delivered by said second endless conveyor chain directly to the other associated one of said spaced two weapon barrels.

4,840,110

DEVICE FOR STORING AND LOADING AMMUNITION IN A TURRET

Helmut Fischer, Dusseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,329

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702426

Int. Cl.[4] F41F *9/06*

U.S. Cl. 89—46 **5 Claims**

1. A weapon device, comprising:

a holding member for holding ammunition prior to launch

through an end thereof, said holding member having first and second opposite sides;

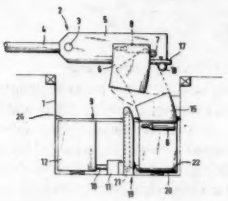
first and second shaft magazines respectively mounted to said opposite sides of said holding member, each of said first and second shaft magazines having at least one shaft;

a turret having a turret basket;

a ring magazine rotatively mounted in said turret basket for rotation about a vertical axis, said ring magazine having a plurality of vertical radially oriented ring shafts for receiving ammunition;

drive means for rotating said ring magazine about said vertical axis;

an auxiliary shaft device having auxiliary shafts and being fixed to said turret above said ring magazine so that respective ones of said ring shafts are alignable with said auxiliary shafts upon rotation of said ring magazine by said drive means, said auxiliary shaft device being fitted to said turret below said first and second shaft magazines, said



holding member being moveable into and away from an indexed position in which the shafts of said first and second shaft magazines are aligned with said auxiliary shafts therebelow; and

a lifting device having means for lifting ammunition stored in said ring magazine into said first and second shafts via said auxiliary shafts;

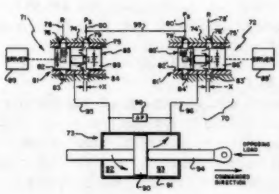
wherein said holding member is a tubular weapon pivotable about a horizontal axis relative to said turret, and wherein said first and second shaft magazines are pivotally mounted to said tubular weapon for pivotal movement about an axis parallel to said horizontal axis between a first position in which said first and second shaft magazines are spaced from said auxiliary shaft device and a second position in which said first and second shaft magazines are aligned with said auxiliary shaft device when said tubular weapon is in said indexed position, said indexed position defining a predetermined pivotal position of said tubular weapon about said horizontal axis.

4,840,111

ENERGY-CONSERVING REGENERATIVE-FLOW VALVES FOR HYDRAULIC SERVOMOTORS

Kenneth D. Garnjost, Buffalo, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Jan. 31, 1986, Ser. No. 825,136
Int. Cl.[4] F15B *11/02, 11/20*
U.S. Cl. 91—436 **89 Claims**



1. In a servomechanism associated with a source of pressurized fluid at a supply pressure, the improvement which comprises:

a first valve and a second valve, each of said valves having one member movable relative to another member, each of said other members having a supply opening communicating with said source, having a return opening, and having a control opening, each of said one members being movable within a first positional range relative to the associated other member to increase the pressure at the associated control opening and being movable within a second positional range to decrease the pressure at the associated control opening;

a first conduit communicating one of said first valve supply and return openings with the like one of said second valve supply and return openings;

a first driver operatively arranged to move said first valve one member to a desired position relative to said first valve other member;

a second driver operatively arranged to move said second valve one member to a desired position relative to said second valve other member;

a sensor for determining a pressure differential at said first and second valve control openings; and

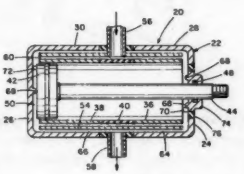
a controller operatively associated with said sensor and with said drivers for causing said first valve one member to move to an appropriate position within one of its positional ranges and for causing said second valve one member to move to an appropriate position within the other of its positional ranges when the pressure at one of said control openings is greater than the pressure at the other of said control openings, and for causing both of said first and second valve one members to move to appropriate positions within like ones of said positional ranges when the pressure at said one control opening is less than the pressure at said other control opening.

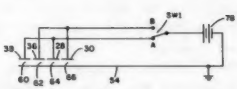
4,840,112

COMBINED VALVE/CYLINDER USING ELECTRO-RHEOLOGICAL FLUID

Dilip K. Bhadra; Richard L. Creedon, both of San Diego, and C. Ross Harder, Rancho Sante Fe, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jan. 12, 1988, Ser. No. 142,995
Int. Cl.[4] F15B *13/044*
U.S. Cl. 91—459 **7 Claims**





1. Electrically controlled combined valve/cylinder apparatus, said apparatus comprising:

a housing including a substantially cylindrical body, and spaced first and second end walls closing said body, said first end wall having an aperture;

a cylinder disposed inside said body, said cylinder and said body being substantially concentric;

a piston disposed in said cylinder;

a control ram connected to said piston and extending through said aperture in said first end wall, said piston being movable between a first position adjacent said first end wall in which said ram is extended and a second position wherein said piston is disposed adjacent said second end wall so that said ram is retracted;

a substantially cylindrical control sleeve disposed between and spaced from both said body and said cylinder;

inlet means for supplying an electro-rheological fluid inside said housing;

outlet means for discharging said fluid from said housing;

said control sleeve, said body and said cylinder each being at least partially electrically conductive and together forming four electrostatically controlled valves, actuation of the first and third valves causing the ram to retract, actuation of the second and fourth valves causing said ram to extend,

one of said inlet means and outlet means comprising a first port tube extending through said body and said sleeve, and the other of said inlet means and outlet means comprising a second port tube extending through said body but not said sleeve.

4,840,113

LOUVER VENT FOR THE VENTILATION OF A MOTOR VEHICLE PASSENGER COMPARTMENT

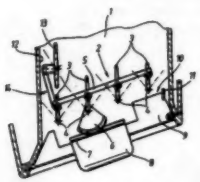
Elmar Freitag, Weil der Stadt; Karl-Heinz Weller, Gerlingen, and Hans-Wilhelm Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,836

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719835

Int. Cl.[4] F24F *13/15*

U.S. Cl. 98—2 **8 Claims**



3. Louver vent arrangement for controlling air flow into a vehicle passenger space or the like, comprising:

a first row of movable air deflection slats arranged substantialy parallel to one another,

a second row of movable air deflection slats arranged substantially parallel to one another and disposed downstream of said first row of slats,

a joint operating handle for jointly moving the first and second row of slats,

and at least one housing air deflection slat means dispsoed adjacent a housing wall means of louver housing at a location upstream of said at least one of the first and second rows of slats, said housing air deflection slat means being movable operable by the joint operating handle from a position wherein it is in parallel with the wall means and deflects no air, into a position at an angle with said wall means for directing air flow away from the housing wall means toward a respective oppositely directed slat of one of the first slats has been moved past a central position of said first row of slats.

4,840,114

AIR OUTLET DEVICE

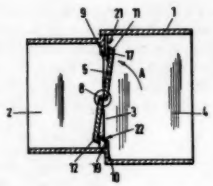
Karl-Heinz Bauer, and Gerold Eckert, both of Bad Neustadt, Fed. Rep. of Germany, assignors to Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co., Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 180,951

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713591

Int. Cl.[4] B60H *1/26*

U.S. Cl. 98—2 **10 Claims**



1. An air outlet device, comprising:

a housing body having an air passage opening, said air passage opening defining a closing plane and two seat edges;

an elastically distortable closure flap which is mounted pivotably around a swivelling axis and located near the air passage opening, said closure flap defining two sealing edges, each sealing edge corresponding to one of the seat edges of the air passage opening, the swivelling axis being situated essentially parallel to and between the sealing edges;

an actuating part located adjacent to one end of the closure flap, said actuating part being operable so as to pivot the closure flap between an open position, a closed position, and a closing position located between the open position and the closed position;

wherein when the closure flap is in the closing position, a longitudinal gap is formed between each sealing edge and its corresponding seat edge, said longitudinal gap narrowing from a first end of the closure flap adjacent to the actuating part toward a second end of the closure flap remote from the actuating part so that when the closure flap is moved from the closing position to the closed position, the seat edges progressively contact the sealing edges along the closure flap from the second end to the first end of the closure flap.

4,840,115

AIR OUTLET ARRANGEMENT OF A HEATING AND/OR AIR-CONDITIONING INSTALLATION, ESPECIALLY FOR THE REAR SPACE OF A PASSENGER MOTOR VEHICLE

Paul Johnson, Munich, and Karl W. Karnebogen, Kottgeisering, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 188,915

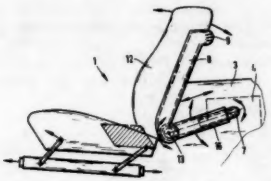
Claims priority, application Fed. Rep. of Germany, May 4, 1987, 3714820

Int. Cl.[4] B60H *1/34*

U.S. Cl. 98—2.03 **8 Claims**

1. An air outlet arrangement of a heating and/or air-conditioning system especially for the rear space of a passenger motor vehicle, wherein the motor vehicle has two front seats with a center tunnel therebetween, the outlet arrangement comprising pivotal outlet channel means which at least in one pivot position is spatially integrated in or at other interior equipment components arranged in the passenger motor vehi-

cle rear space so as to provide a substantially smooth contour therewith, and wherein said pivotal outlet channel has a pivot



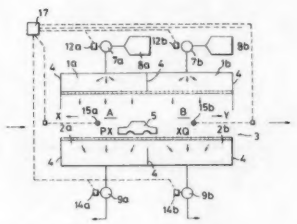
means which is connected at an air outlet located between the front seats on said center tunnel.

4,840,116

CONTROLLING METHOD FOR OPERATION OF PAINTING BOOTH

Akihiro Murakami; Mitsunobu Matsunaga, and Yasunari Tanemura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 21, 1987, Ser. No. 135,381
Claims priority, application Japan, Jan. 10, 1987, 62-3693
Int. Cl.[4] B05C *15/00*
U.S. Cl. 98—115.2 **7 Claims**



7. A method of controlling the operation of a painting booth having fore and rear painting zones with opposing air inlet and air exhaust chambers, comprising the steps of:

generating a vertical air current between the air inlet and exhaust chambers of the fore and rear zones at times when an object is to be painted in said corresponding zone;

detecting the speed of horizontal air currents in the rear zone;

detecting the quantity of air exhausting from the fore zone;

decreasing the quantity of air exhausting from the fore zone at times when an object to be painted is in the rear zone;

controlling the quantity of air entering the fore zone from the corresponding inlet chamber in accordance with the detected speed of the horizontal air currents in the rear zone;

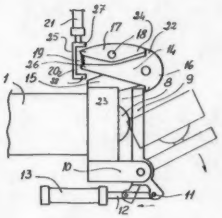
maintaining the quantity of the inlet air and constant to the fore zone at times when the decreasing quantity of air exhausting from the fore zone reaches zero for terminating the air current in the fore zone.

4,840,117

MACHINE FOR THE PRODUCTION OF PUFFED CEREALS

Alfredo R. Fonticoli, Via Milano, 23, 20090 - Cesano Boscone (Milano), Italy

Filed Apr. 10, 1987, Ser. No. 37,221
Claims priority, application Italy, Dec. 9, 1986, 22615 A/86
Int. Cl.[4] A23L *1/00, 1/18*
U.S. Cl. 99—323.4 **2 Claims**



1. A machine for the production of puffed cereals comprising:

at least one pair of rotatable drums disposed alongside one another, each drum having a closed end an an open end, said open end being closable by a sealing door hingedly mounted at said open end of each said drum, said sealing door being movable between an open position and a closed position,

said rotatable drums being mounted on a box like frame rigid with a platform turnable about a transverse axis,

fluid pressure actuating means associated with each said sealing door of each said drum, said fluid pressure actuating means being provided for automatically opening and closing the associated said sealing door,

a latch mechanism associated with each said sealing door and operable automatically to lock each said door in the closure position and to release each said door at the end of a cereal treatment operation,

said platform being pivoted a the end thereof adjacent said closed ends of said drums and being engaged at a point remote from said pivoted end by at least one double-acting fluid pressure actuator which is extendable to tilt said platform to bring said open ends of said drums into register with respective cereal supply ducts,

each said sealing door being fixedly connected to a respective plate having a lower part pivoted to a projecting portion of an associated drum of said drums, said plate being provided with at least one projecting arm laying at an angle to the plane of said plate, said machine further comprising

a fluid pressure actuator, having an actuating rod connected to said projecting arm whereby extension and retraction of said fluid pressure actuator causes rotation of said plate and closure and opening of said door,

said latch mechanism cooperating with said plate to hold said door in the closure position thereof, said latch mechanism comprising

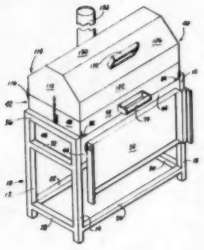
a latch body pivotally connected to a second projecting portion of each said drum, said latch body having the shape of an isoscele triangle of small angle, an arcuate projecting portion of said latch body at the base thereof, respective upper and lower nose projections of said projecting base portion, said lower nose projection being engageable with said plate and said upper nose projection being engageable with one end of a locking rocker member pivoted in the vicinity of the mid point thereof.

4,840,118

OUTDOOR GRILL WITH EXTRACTABLE FOOD SUPPORTING RACK

Homer L. Rinehart, 1603 NW. 4th St., Lindsay, Okla. 73052

Filed Aug. 7, 1987, Ser. No. 82,684
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—446 **21 Claims**



1. An outdoor grill comprising:
a vertically extending standard;
a housing mounted at the top of said standard and including:
a fuel-containing base portion; and
a hood having a lower edge and being hingedly connected to said base portion for pivotation about a horizontal pivotal axis from a first, closed position to an open position;
a fuel-supporting grate vertically removably positioned in the lower portion of said housing in said base portion for supporting a combustible fuel;
a foraminous food-supporting rack assembly horizontally reciprocably mounted in said base portion of said housing above said fuel-supporting grate;
an opening in one side of the base portion of said housing through which said food-supporting rack assembly can be pulled directly outwardly in horizontal reciprocation for purposes of removing the food on the food-supporting rack assembly from the interior of the housing; and
a drip pan assembly pivotally secured to a side of the base portion of said housing for pivotation about a horizontal axis located adjacent the opening into the base portion of said housing, said drip pan assembly including:
a pan having confining flanges extending around the outer perimeter thereof; and
track means secured to said flanges for movably supporting said food-supporting rack assembly when said food-supporting rack assembly is extricated from said housing by movement horizontally through said opening in the base portion of said housing from the interior of the housing to the exterior thereof to a position over said drip pan assembly and at rest upon said track means.

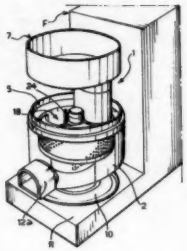
4,840,119

DEVICE FOR SQUEEZING TOMATOES

Carlo Caldi, Novara, Italy, assignor to Girmi S.P.A. Corso Matteoth, Milan, Italy

Filed Jul. 27, 1988, Ser. No. 224,757
Claims priority, application Italy, Aug. 26, 1987, 67741 A/87
Int. Cl.[4] A23N *1/00*
U.S. Cl. 99—512 **16 Claims**

1. A tomato-squeezing device which separates the juice from the waste, wherein it comprises:
a bowl-shaped container for collecting the juice,
a basket which can be mounted for rotation within the bowl-shaped container, the basket having a generally cylindrical shape with a base wall, a perforated peripheral wall, and tomato entrainment formations facing towards the inside of the basket, and
a shaped cover which can be inserted into the basket and has system of walls which define, within the bounds of the cover, an inner waste-collection chamber and, together with the basket, a squeezing duct which tapers generally from an entry region where tomatoes enter the duct to a terminal region, the cover also defining a duct for supply-



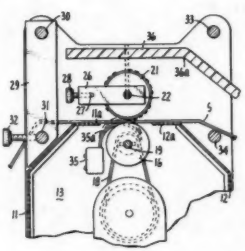
ing the tomatoes to the entry region and at least one aperture located at the terminal region of the squeezing duct which puts the terminal region of the squeezing duct into communication with the waste-collection chamber located at the cover.

4,840,120

PRINTER FOR A STRIP OF TICKETS

Matthew J. Swiech, Antioch; Gary D. Munyon, and Kenneth J. Dias, both of Concord, all of Calif., assignors to G & B Rubber Stamp Co., Inc., Concord, Calif.

Filed May 18, 1987, Ser. No. 51,298
Int. Cl.[4] B41F *5/04*
U.S. Cl. 101—228 **5 Claims**



1. An imprinter for use in applying numbers, names or other indicia upon tickets, comprising:
a rectangular housing and support frame including front, rear and side plates, each side plate having an elongate slot formed therein;
a drive motor and an elongate roller mounted within said rectangular housing and support frame; said roller being mounted between said side plates on a first horizontal axis and operatively connected to said motor;
a non-rotating floating axle of support mounted between said side plates on a second horizontal axis parallel to and above said first horizontal axis, the ends of said floating axle being engaged with the elongate slots, respectively;
means for engaging the ends of said floating axle for vertically positioning said axle relative to said first horizontal axis;
a friction roller rotatably mounted and supported upon said floating axle, the peripheral surface of said friction roller being in close proximity or in contact with the upper periphery of said elongate roller;
an imprint roller rotatably mounted and supported upon said

floating axle, the peripheral surface of said imprint roller being in close proximity or in contact with the upper periphery of said elongate roller;

an inking wheel and mounting arm, said arm being secured to said floating axle, said wheel being rotatably mounted from said arm and peripherally engaged with said imprint roller; and

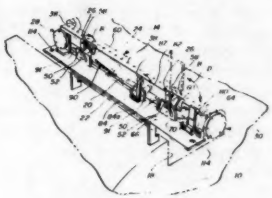
guide means for aligning and directing a strip of tickets between said drive roller and said friction and imprint rollers.

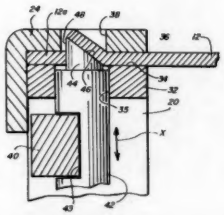
4,840,121

MASTER HOLDING MECHANISM FOR DUPLICATING MACHINES

Stanley J. Szczesniak, Lindenhurst, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Nov. 26, 1986, Ser. No. 935,367
Int. Cl.[4] B41F *27/12, 13/54*
U.S. Cl. 101—415.1 **16 Claims**





15. A mechanism for holding a master, printing plate or the like on a cylinder of a duplicating, printing or like machine, comprising:

an elongated housing mounted on the cylinder and extending transversely across the periphery of the cylinder;

an elongated die plate extending along the housing and having a series of holes spaced therealong;

a pin bar extending along the housing in juxtaposition to the die plate and having pins in line with the holes in the die plate, the pins having sharpened ends for piercing masters that are not provided with pre-punched perforations; and

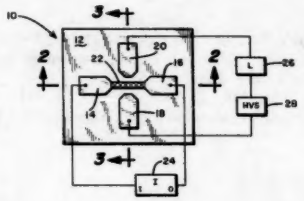
actuator means operatively associated between the die plate and the pin bar for effecting relative movement therebetween for moving the pins through a master and into the holes in the die plate to hold the master, including means for moving said pins only partially through the master to hold the master but to prevent formation of residue pieces which might fall into the machine.

4,840,122

INTEGRATED SILICON PLASMA SWITCH

Eldon Nerheim, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 18, 1988, Ser. No. 182,378
Int. Cl.[4] F42C *19/12*; F42B *3/12*
U.S. Cl. 102—202.5 **12 Claims**



1. An integrated circuit device for switching high currents, comprising:

(a) a silicon chip substrate having first and second pairs of conductive contacts deposited on at least one surface of said substrate, said contacts being spaced apart along two mutually perpendicular axes;

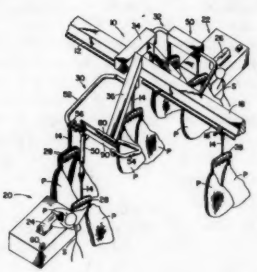
(b) a strip of material which, when vaporized, creates a plasma cloud, disposed on said silicon chip substrate joining said first pair of contacts to one another, said strip of material extending between but out of physical contact with said second pair of contacts.

4,840,123

CONVEYORIZED APPARATUS WITH MOVEABLE RAIL SECTION

Harold L. Osthus, West Willington; John F. de Raismes, Simsbury; Lawrence S. Wolfson, West Hartford, and Robert M. Vaida, Ellington, all of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Continuation-in-part of Ser. No. 937,927, Dec. 4, 1986, abandoned. This application Oct. 29, 1987, Ser. No. 117,433
Int. Cl.[4] E01B *25/24*
U.S. Cl. 104—100 **16 Claims**



12. A conveyorized transport apparatus for moving articles supported by a trolley along a rail system to and from a work station comprising:

an incoming rail section on which trolleys and supported articles approach the work station;

an outgoing rail section on which trolleys and supported articles depart from the work station;

a moveable rail section pivotally connected at one end with one of the other rail sections for movement between a conveying position for transferring the trolley and load between the incoming and outgoing rail sections, and a

diverted position for locating the trolley and supported load closer to the work station than in the conveying position; and

actuating means for pivoting the moveable rail section between the conveying and diverted positions,

said moveable rail section being pivotable about two generally orthogonal axes relative to said one of the other rail sections.

4,840,124

ROVE BOBBIN TRANSPORTING SYSTEM

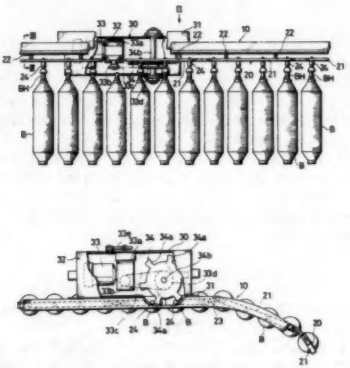
Fumio Tadashima, Kanazawa, Japan, assignor to Murao Boki Kabushiki Kaisha, Kanazawa, Japan

Filed May 20, 1988, Ser. No. 196,425

Claims priority, application Japan, May 27, 1987, 62-131005

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—163 **8 Claims**



1. In a rove bobbin transporting system which includes a transport rail and an elongated carrier mounted for movement along said transport rail and having a plurality of bobbin hangers provided in a juxtaposed relationship thereon for removably hanging rove bobbins thereon, wherein the improvement comprises a plurality of driving devices for moving said carrier which are disposed in a spaced relationship by a distance smaller than the overall length of said carrier along said transport rail and each include a drive motor and a rotary sprocket wheel having a plurality of teeth, and a plurality of engaging members for engaging with said teeth of said rotary sprocket wheel, respectively, said engaging members being along the longitudinal dimension of said carrier and wherein said engaging members comprise brackets for mounting said bobbins to said carrier.

4,840,125

APPARATUS FOR RAIL OPERATION COMPRISING A LONG-STATOR LINEAR MOTOR

Wilbrand Lueers, Braunschweig, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,227

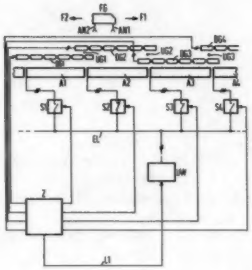
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722295

Int. Cl.[4] B60L *13/10*

U.S. Cl. 104—292 **1 Claim**

1. In an apparatus for rail operation of the type which comprises a long-stator linear motor, in which a propulsion traveling wave winding is supplied by a distributing sub-station parallel thereto, a double line which is crossed at regular intervals and is connected to a stationary central station are positioned along the path of travel, and in which a vehicle carries at least one antenna arranged in a vehicle-symmetrical manner and is inductively coupled to the double line for data exchange with the central station, the improvement wherein:

said propulsion traveling wave winding is divided into individual sections, each of said sections being separately supplied with propulsion energy, said double line is similarly divided into sections of corresponding lengths that overlap with a predetermined length at the section boundaries;



a vehicle traveling said railway includes means for generating signals which are transmitted by said at least one antenna in a section; and

a control means for receiving said signals and producing control signals for the section; and

switch means connected to said control means and to said sections and responsive to said control signals for controlling the energization of said sections.

4,840,126

RAILROAD HATCH COVER HAVING AN INTEGRAL HOLDDOWN BAR THEREFOR

Donald L. Kleykamp, 6014 Gothic Pl., Dayton, Ohio 45459

Continuation of Ser. No. 856,899, Apr. 28, 1986, abandoned, which is a division of Ser. No. 459,069, Jan. 19, 1983, Pat. No. 4,602,569. This application Aug. 26, 1987, Ser. No. 89,464

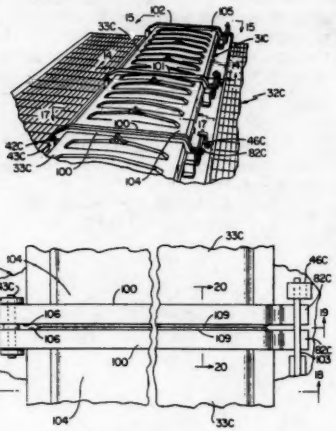
The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.[4] B61D *39/00*

U.S. Cl. 105—377 **7 Claims**

1. In a combination of a hatch cover for a railroad car and a holddown bar for said hatch cover, said hatch cover having opposed ends, said holddown bar having opposed ends one of which is adapted to be pivotally mounted to said car and the other of which is adapted to be releasably latched to said car while a medial portion thereof intermediate said opposed ends extends transversely across said hatch cover, the improvement wherein said holddown bar and said hatch cover comprise a one-piece homogeneous member formed of polymeric material, said holddown bar being disposed at one of said opposed ends of said hatch cover and having a flat end face that is

disposed substantially transverse to said hatch cover, said end face carrying a gasket for sealing to an adjacent hatch cover



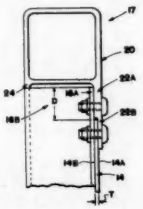
and holddown bar combination when the two combinations are in the closed condition thereof.

4,840,127

TOP CHORD FOR OPEN TOP HOPPER CARS

Jan Z. Tomaka, Quebec, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Dec. 4, 1987, Ser. No. 128,930
Int. Cl.[4] B61D *17/08*
U.S. Cl. 105—406.1 **19 Claims**



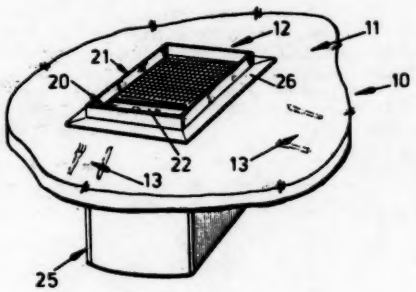
1. A chord for attachment to a pair of structural members, one being a planar member and the other being a reinforcing member, said chord comprising a stem for attachment to the structural members, and a chord section integral with the stem and extending transverse thereto, said stem comprising a relatively thick proximal portion connected with the chord section and a thinner distal portion cooperating with the thick portion to define a step of a predetermined width on one side of said stem, the other side of said stem being substantially planar, the thick portion of the stem comprising means for resisting bending moments action on the stem and transferring said force from the stem to the reinforcing member, said thick portion of stem further being adapted for direct engagement with the reinforcing member and the thinner distal portion adapted to sandwich the planar structural member between the thinner portion of the stem and the reinforcing member, said chord section extending transversely to said stem in a predetermined direction, said chord section having a lip member integral with the chord section and extending away from the chord section at a location spaced from the stem and in a direction generally parallel thereto, the lip being adapted for bearing on a portion of the reinforcing member.

4,840,128

EATING TABLE WITH INSET BARBECUE

Robert McFarlane, and Stewart M. Walker, both of Glasgow, Scotland, assignors to Trading Post Restaurants Limited, Glasgow, Scotland

Filed Mar. 1, 1988, Ser. No. 162,421
Int. Cl.[4] F24C *3/00*
U.S. Cl. 108—50 **3 Claims**



1. An eating table having a table top with a centrally disposed aperture which is surrounded by an eating zone capable of accommodating a plurality of eating stations from which seated persons may consume food,

a charcoal gas-fired grill barbecue set into said aperture and having a body which is located beneath the table top and which is surrounded by a housing which forms part of the table and which supports the table top,

the barbecue comprising a charcoal bed filled with charcoal lava pieces located beneath a substantially horizontal griddle which is level with the table top and on which food may be barbecued, and between the griddle and the charcoal bed there is a plurality of dished slats for collecting grease emanating from food being grilled on the barbecue, the slats being inclined at an angle to the horizontal for delivering their collected grease into a grease tray,

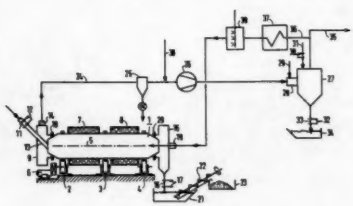
the arrangement being such that persons seated around the perimeter of the table can both grill food and eat food at the table.

4,840,129

PYROLYSIS SYSTEM

Horst Jelinek, Offenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,410
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633212
Int. Cl.[4] F23G *5/12*
U.S. Cl. 110—229 **9 Claims**



1. A pyrolysis system for trash and refuse utilization having a heated low temperature carbonization drum with a device for

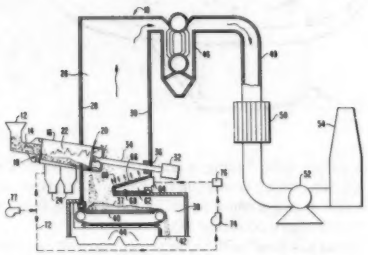
feeding material to be carbonized located at one end face of the drum, a residue discharge device at the other end face of the drum, a low temperature carbonization gas exhaust, and a gas converter connected to the low temperature carbonization gas exhaust for converting the low temperature carbonization gas into cracked gas, comprising means for supplying to the low temperature carbonization drum part of a quantity of cracked gas flowing out of the gas converter as a heat carrier.

4,840,130

WASTE DISPOSAL SYSTEM

John M. Quiel, Long Beach, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 21, 1988, Ser. No. 222,586
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—234 **16 Claims**



1. A waste disposal system for the combustion of waste materials comprising:

a combustor having an inlet end and an outlet end;

a furnace enclosing the outlet end of said combustor, said furnace having a front wall through which said outlet end extends and a back wall; and

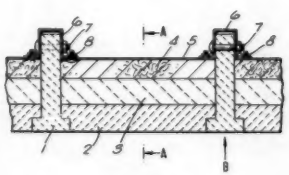
a step extending out from said back wall spaced from and below said outlet end, said step being hollow on the inside thereof to form a plenum chamber to receive air and having an upper surface which defines a plurality of openings into said furnace whereby air injected through said openings deflects airborne ash and combustible solids from the outlet end of said combustor up into said furnace.

4,840,131

INSULATING LININGS FOR FURNACES AND KILNS

Henry R. Meumann, Lichfield, United Kingdom, and Johannes Stark, Mechernich, Fed. Rep. of Germany, assignors to Foseco International Limited, Nechells, Great Britain

Filed Sep. 8, 1987, Ser. No. 93,942
Claims priority, application United Kingdom, Sep. 13, 1986, 8622114; Aug. 3, 1987, 8718286
Int. Cl.[4] F23M *5/00*
U.S. Cl. 110—336 **8 Claims**



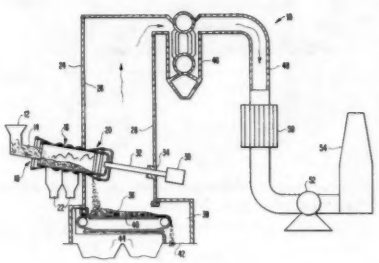
1. A furnace or kiln for the heat treatment of materials or articles, said furnace or kiln having an inner lining comprising boards of refractory, heat-insulating material where said boards are restrained from inward movement by rails of a ceramic fiber-based refractory heat-insulating material having shoulders at their inward side against the back of which shoulders edge portions of said boards rest, the thermal conductivity of said rails being not greater than 0.1 $w.M^{-1}.°K^{-1}$ at ambient temperature, the rails having a density within the range of 0.2 to 0.75 $g.cm^{-3}$.

4,840,132

ROTARY COMBUSTOR

Vince A. Jose, Brea, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 21, 1988, Ser. No. 222,592
Int. Cl.[4] A47J *36/00*
U.S. Cl. 110—246 **6 Claims**



1. A rotary combustor comprising:

a plurality of water cooled tubes secured directly to each other in abutting relationship to form a cylindrical barrel defining a combustion chamber therein, said barrel having a charge end and a discharge end;

means interconnecting said tubes for circulating water therethrough; and

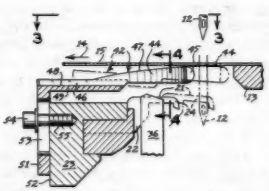
wherein at least certain of said tubes are bent outwardly from the center of said barrel at spaced locations along their lengths to form a plurality fo openings in said barrel to allow combustion air into said combution chamber.

4,840,133

NEEDLE PLATE FOR HOOK BAR OF CUT PILE TIFTING MACHINE

Charles W. Watkins, Ooltelwah, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Sep. 19, 1988, Ser. No. 245,529
Int. Cl.[4] D05C *15/08*
U.S. Cl. 112—80.3 **11 Claims**



1. In a cut-pile tufting machine having a plurality of needles for introducing yarns through a base fabric movable front-to-rear in a longitudinal path through the machine to form transversely spaced, longitudinal rows of loops, a transversely extending hook bar supporting a plurality of cut pile hooks having bills projecting forward, knives for cooperating with

said hooks to cut said loops, means for reciprocably moving said hook bar longitudinally below said longitudinal path between a forward operative position cooperating with a corresponding needle to form a loop and a rearward position cooperating with a corresponding knife for cutting said loop to form a cut pile tuft, means supporting said base fabric comprising:

(a) a plurality of elongated needle plate fingers having front and rear end portions,

(b) support means mounting the rear end portions of said needle plate fingers on said hook bar to cause said front end portions to project forward above said hooks,

(c) said front end portions projecting forward far enough to extend between corresponding needles when said hooks are in said forward operative positions, and

(d) said needle plate fingers having top surfaces supporting said base fabric as said base fabric moves longitudinally through said machine.

4,840,134

MACHINE FOR PRODUCING A TRIPLE-THREAD CHAIN STITCH FOR SEWING WEBS OVER AN EDGE

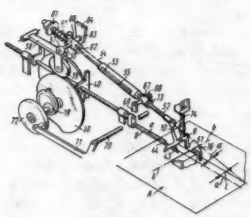
Nikolai N. Raikov, Kerch, U.S.S.R., assignor to Tsentralnoe Proektno-Konstruktorskoe Bjuro Vsesojuznogo Rybopromyshlennogo Obiedinenia Azovo-Chernomorskogo Basseina, Sevastopol, U.S.S.R.

PCT No. PCT/SU85/00066, § 371 Date Mar. 25, 1987, § 102(e) Date Mar. 25, 1987, PCT Pub. No. WO87/00873, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 30, 1985, Ser. No. 35,732

Int. Cl.[4] D05B *1/20, 57/06*

U.S. Cl. 112—162 **5 Claims**



1. A triple-thread stitching machine for sewing webs over their edges, comprising a framework (13) having mounted thereon means (14) for guiding the webs into a sewing zone; retaining means (16) for retaining the sewn up edges of the webs; a device (17) for advancing the webs and a main shaft (18) operatively connected with mechanisms (19, 20, 21), respectively, for driving a sewing needle (8) mounted on a needle bar (39), a looper needle (9) mounted on an associated rod (45) and a looper hook (10) mounted in a canti-lever fashion on a telescopic rotatable bar, the looper hook (10) being mounted for moving about the needle (8) at the side of the device (17) for advancing the webs, the telescopic rotatable bar being offset from the needle bar (39) towards the device (17) for advancing the webs and inclined with respect to an imaginary plane including the axis of the needle (8) and the line of stitching through the edges of the webs, the needle (8) having an eye (43) and being so mounted in the needle bar (39) that its eye (43) faces the device (17) for advancing the webs, and the needle (8) having a groove (44) made therein at the same side thereof, behind the eye (43).

4,840,135

SEWING MACHINE CONTROLLER INHIBITING SEWING IN UNSAFE CONDITIONS

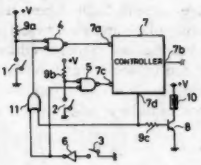
Satomi Yamauchi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 937,281, Dec. 3, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 165,824

Claims priority, application Japan, Dec. 3, 1985, 60-272005; Dec. 3, 1985, 60-272006

Int. Cl.[4] D05B *69/36*

U.S. Cl. 112—277 **3 Claims**



1. A sewing machine controller having an automatic lifting mechanism for a cloth presser, comprising:

a first switch for controlling the rotation of a sewing machine motor shaft via a rotation command signal;

means for detecting conditions dangerous to an operator of said sewing machine;

means for inhibiting said rotation command signal responsive to an ouptut of said detecting means;

means for raising said cloth presser of said sewing machine; said detecting means detecting a raising of said cloth presser;

a treadle switch; and

means for inhibiting said cloth presser raising means upon closure of said treadle switch.

4,840,136

PROPELLER DRIVE FOR BOATS

Lennart H. Brandt, Fjärås, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

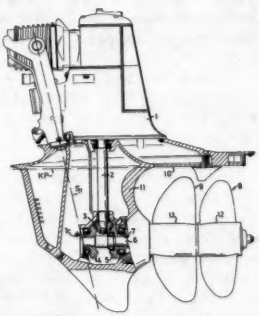
Continuation of Ser. No. 778,310, Sep. 20, 1985, Pat. No. 4,698,036, which is a continuation of Ser. No. 531,613, Sep. 12, 1983, abandoned. This application Sep. 11, 1987, Ser. No. 95,112

Claims priority, application Sweden, Sep. 13, 1982, 8205215

The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.

Int. Cl.[4] B63H *21/24*

U.S. Cl. 440—78 **4 Claims**



1. In a propeller drive unit for boats having steering means to steer same and a pair of concentric counter-rotationally drive propeller shafts in a drive housing, each of said shafts carrying

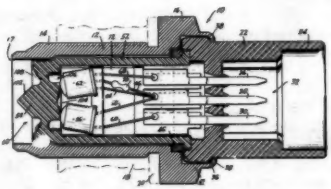
at least one propeller having a hub, said drive housing having a substantially vertical output drive shaft extending generally the length of said housing and having its lower end coupled to said pair of shafts, and a steering axis for steering said drive housing thereabout, and an anti-cavitation plate located above said propellers, the improvement wherein said drive housing comprises a forward projected surface located beneath a first plane generally horizontally defined by said anti-cavitation plate and forwardly of a second plane passing generally laterally through said first plane and through and along said steering axis, said forward projected surface being at least half but at most twice as large as a rearward projected surface of a portion of said drive housing located beneath said first plane and behind said second plane and a rearward projected surface of said hubs of said propellers thereby reducing the resultant steering torque exerted by the water flow force on said drive unit counteracting against transverse forces of said propellers whereby steering forces to be applied to said steering means is reduced.

4,840,137

LIQUID LEVEL GAUGING APPARATUS

Thomas Beauvais, Hamden; Vincent G. Krenke, Fairfield; Peter J. Lupoli, Hamden, and Donald J. Mattis, Norwalk, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Continuation of Ser. No. 68,575, Jul. 1, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 266,577
Int. Cl.[4] G01F *23/02*
U.S. Cl. 116—227 **19 Claims**



1. An indicator for displaying when the height of a liquid in a vessel reaches a preselected height, said vessel having a wall and said indicator comprising in combination:

(a) a cup-like enclosure having a bottom wall comprising prism means having exterior and interior surfaces, the exterior surface of said prism means being conical and being located for immersion in the liquid to be monitored when said liquid reaches said preselected height,

(b) a light source,

(c) a light-responsive means, and

(d) means for mounting said light source and light-responsive means in close juxtaposition adjacent said prism means and in said cup-like enclosure,

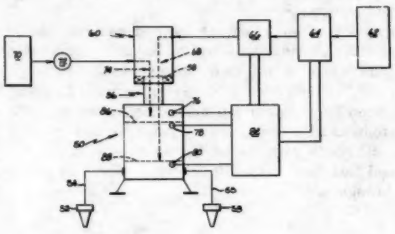
(e) the interior surface of said prism means having a light-admitting substantially conically-shaped recess which is substantially coaxial with the conical exterior surface of the prism means, said prism means enabling light rays from said light source to pass into the surface of its conically-shaped recess and to be bent, by refraction, to strike the conical exterior surface of the prism means and said prism means enabling reflected rays from said conical exterior surface of the prism means to pass through the surface of said conically-shaped recess and to be thereby bent, by refraction, to strike the said light-responsive means so as to indicate the presence or absence of liquid at the conical exterior surface of said prism means.

4,840,138

FLUID DISPENSING SYSTEM

James S. Stirbis, Littleton, Colo., assignor to Preferred Machining Corporation, Englewood, Colo.

Filed Dec. 23, 1986, Ser. No. 945,515
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—694 **12 Claims**



1. A sealant supply system for a sealant applying machine having a plurality of rotatable sealant applying head devices rotatable about a central axis of rotation and comprising:

support means for supporting said system on the machine;

a rotatable sealant supply chamber means mounted on said support means for holding a supply of sealant material and having a bottom wall portion, a side wall portion, and an upper wall portion;

coupling passage means in a lower portion of said chamber means for connection to the sealant applying head devices to supply sealant thereto;

a spindle means mounted on said upper wall portion of said chamber means for enabling rotation of said chamber means;

a first central passage means in said spindle means enabling supply of air and sealant to said chamber means;

bearing journal means and bearing means on an outer wall portion of said spindle means for rotatably supporting said spindle means;

a non-rotatable housing means for receiving and rotatably supporting said bearing means and said spindle means;

a second central passage means in said non-rotatable housing means for connection to said first central passage means for enabling supply of air and sealant to said chamber means;

passage sealing means between said spindle means and said housing means for sealing said first central passage means relative to said second central passage means;

a sealant delivery tube means mounted in said first central passage means and said second central passage means and having a discharge opening located in said chamber means for supplying sealant to said chamber means; and

air passage means circumjacent said tube means and defined by said tube mean and said first central passage means and said second central passage means for supplying pressurized air to said chamber means.

4,840,139

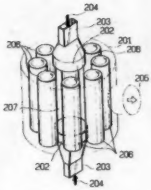
APPARATUS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM USING MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION PROCESS

Tetsuya Takei, Ueno, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1987, Ser. No. 102,010
Claims priority, application Japan, Oct. 1, 1986, 61-231304
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—723 **4 Claims**

1. In an apparatus for the formation of a functional deposited film on a plurality of cylindrical substrates by means of microwave plasma chemical vapor deposition, said apparatus having a cylindrical deposition chamber comprising a circumferential

wall having an end portion thereof provided with a microwave introducing window to which a waveguide extending from a microwave power source is connected, said cylindrical deposition chamber having a plasma generation space circumscribed by a plurality of rotatable cylindrical substrate holders, each said substrate holder having one of said cylindrical substrates thereon, said rotatable cylindrical substrate holders being concentrically arranged in said cylindrical deposition chamber, said cylindrical deposition chamber being provided with means for supplying a film-forming raw material gas into said plasma generation space and means for evacuating said cylindrical deposition chamber, the improvement which comprises: (a) a removable opening and shutting member provided with



said microwave introducing window in order to permit removal or insertion of said cylindrical substrates in said cylindrical deposition chamber; (b) an electromagnetic wave shielding means and (c) a vacuum sealing means being arranged in that order from the side of the plasma generation space on the top of the circumferential wall of said deposition chamber to substantially enclose the inside of said deposition chamber, said electromagnetic wave shielding means comprising a spring structure of a metal selected from the group consisting of iron, copper, nickel, chromium, aluminum, tin, zinc and alloys containing at least one of said metals, which said spring structure exhibits sufficient elasticity to follow the changes in the clearance between said opening and shutting member and said circumferential wall of said deposition chamber.

4,840,140

SECURING MEANS FOR ODORLESS ANIMAL LITTER UNIT

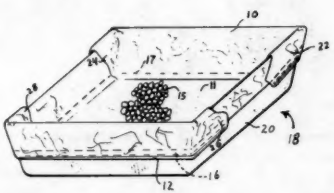
Patrick Yananton, 1518 Little Hill Rd., Point Pleasant, and Janice P. Parker, 365 St. Nicholas Ave., Haworth, both of N.J. 08742

Continuation-in-part of Ser. No. 573,958, Jan. 26, 1984, which is a continuation-in-part of Ser. No. 315,307, Oct. 27, 1981, Pat. No. 4,469,046, which is a continuation-in-part of Ser. No. 909,256, May 24, 1978, abandoned. This application Dec. 31, 1986, Ser. No. 948,209

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] A01K *67/00*

U.S. Cl. 119—1 **27 Claims**



1. In the combination of a litter box and a litter device for use with cats,

said litter box having a base and four walls,

said litter device being a sorbent pad laminate means for the collection of animal urine and comprising:

(a) a bottom sheet layer of moisture impermeable material, and sheet layer being in contact with the base and walls of said litter device;

(b) an intermediate sorbent layer of material having high urine dispersion and sorbency capacity;

(c) a top claw resistant screen means, said screen means being a urine permeable, urine inert, flexible member formed of strands having sufficient tear strength to withstand the clawing action of a cat and sufficiently small hole size to protect said sorbent layer and said sheet layer of moisture impermeable material from being torn by animal claws,

said bottom sheet layer and said top screen means being secured to each other along at least a substantial portion of their periphery;

the improvement comprising: securing means, said securing means removably affixing said sheet layer to said base of said litter device and preventing relative movement between said litter box and said litter device which can be caused by the clawing action of an animal.

4,840,141

AUTOMATIC MILKING APPARATUS

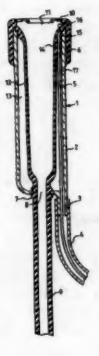
Barry R. Marshall, Ramsden, England, assignor to Ambic Equipment Limited, Withey, England

Filed May 7, 1987, Ser. No. 46,692

Claims priority, application United Kingdom, May 10, 1986, 8611471

Int. Cl.[4] A01J *5/04*

U.S. Cl. 119—14.47 **2 Claims**



1. An automatic milking apparatus including a clawpiece, a cluster of teat cups, each with a teat cup shell housing, a teat cup liner, and short milk tubes connecting each liner with the clawpiece;

said clawpiece including, for each short milk tube connected thereto, a non-return valve for permitting milk flow in the teat cup in a direction towards the clawpiece, away from the teats, and for preventing milk-flow in the opposite direction;

each teat cup liner and short milk tube connected thereto forming an airtight passageway precluding air admission into the apparatus upstream of the respective clawpiece valve during a milking operation; and

each teat cup liner including an air admission passage extending from the interior of the liner to an exterior liner part within the corresponding teat cup shell, and an air admission tube extending from the air admission passage to an air admission control means which is operative, at will, to prevent air admission during a milking operation

and to permit air admission upon completion of a milking operation.

4,840,142

APPARATUS FOR RAISING SMALL ANIMALS

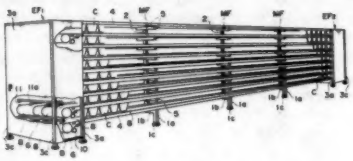
Tetsushi Ishikawa, Okayama; Masato Okabe, Narita, and Hiroyasu Kato, Tokyo, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama and Kabushiki Kaisha Itoki, Osaka, both of, Japan

Filed Oct. 20, 1987, Ser. No. 110,409

Claims priority, application Japan, Oct. 20, 1986, 61-247472

Int. Cl.[4] A01K *31/00*

U.S. Cl. 119—17 **20 Claims**



1. An apparatus for raising small animals, comprising:

end frame housing disposed at longitudinally opposite ends of said apparatus;

a plurality of stands disposed at longitudinally spaced intermediate positions between said end frame housings;

a post mounted upon each one of said plurality of said stands at a central portion thereof with respect to the lateral direction of said apparatus;

a plurality of vertically spaced brackets secured to each one of said plurality of said posts at vertically spaced positions thereof so as to project in laterally opposite directions with respect to said each one of said plurality of said posts and thereby define a plurality of longitudinally extending, vertically spaced rows of brackets;

rack members longitudinally disposed between said end frame housings and secured to said plurality of vertically spaced brackets so as to form a plurality of vertically spaced racks;

cages, for housing said small animals, mounted upon said vertically spaced racks so as to form a plurality of longitudinally extending, vertically spaced rows of said cages;

a plurality of vertically spaced conveyor belts respectively provided below each one of said longitudinally extending, vertically spaced rows of said cages for receiving bodily discharge and food remains from said small animals;

a plurality of vertically spaced means disposed within one of said end frame housings for respectively driving each one of said conveyer belts;

a plurality of vertically spaced means disposed within said one of said end frame housings for respectively cleaning each one of said conveyor belts with respect to said bodily discharge and food remains received thereon; and

trough collection means defined within a bottom portion of said one of said end frame housings and disposed below the lowermost one of said plurality of vertically spaced conveyor belts for collecting said bodily discharge and food remains removed from said plurality of conveyor belts by said cleaning means.

4,840,143

PET FOOD DISPENSER

Allen Simon, E. Northport, N.Y., assignor to Four Paws Products, Ltd., Hauppauge, N.Y.

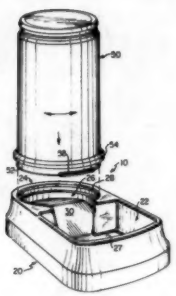
Filed Nov. 20, 1987, Ser. No. 123,129

Int. Cl.[4] A01K *39/00*

U.S. Cl. 119—52 R **12 Claims**

1. A storage and dispensing apparatus of the type including a tray adapted to rest securely on a flat surface and a generally cylindrical storage container extending axially above said tray, comprising:

an annular, inwardly projecting flange formed on a surface of said tray, said flange being interrupted over a predefined circumferential distance thereof; a downwardly and outwardly flaring skirt portion formed near the bottom of said container, the outside diameter of said skirt portion at the point of largest diameter being larger than the inside diameter of said flange;



a plurality of radially outwardly projecting lug members formed on said skirt so as to project radially outwardly beyond said skirt, at least one of said lug members having a circumferential extent which does not exceed the circumferential extent of the interruption in said flange; and

means on said container defining an annular, downwardly facing seat above and proximate to said skirt for engaging said tray from above.

4,840,144

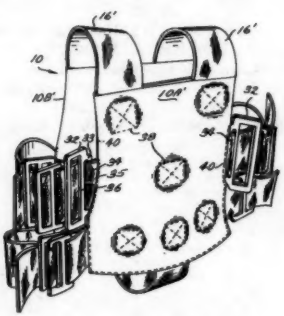
CHILD HARNESS

John L. Voorhees, Kensington, Md., and James Kemp, Henderson, Ky., assignors to Productive Products Limited, Henderson, Ky.

Continuation-in-part of Ser. No. 802,467, Nov. 27, 1985, Pat. No. 4,699,090. This application Oct. 9, 1987, Ser. No. 106,369

Int. Cl.[4] A62B *35/00*

U.S. Cl. 119—96 **4 Claims**



1. A harness for restraining a person positioned in the lap of a person wearing a conventional seat belt, said harness comprising front and rear panels, each said panel including a top edge, spaced side edges extending generally from said top edge to a bottom edge extending between said respective side edges, said top edges of said panels being connected adjacent said respective side edges by first and second strap means, each said

panel having an inner and outer face with said inner faces of said panels facing each other, said bottom edges of said panels being connected by a third releasable and adjustable strap means extending between approximately the midpoint of said respective bottom edges, said side edges of said front and rear panels having each a pair of releasable and adjustable strap means for connecting said side edges, one of said strap means of said pair being located adjacent said respective bottom edges of said panels and the other of said pair of strap means being located approximately at the midpoint of each said side edge, said other of said pair of strap means including seat belt attachment means with said attachment means comprising a pair of belt loops, one being disposed adjacent one side edge of said rear panel and the other belt loop being disposed adjacent the other side edge of said rear panel.

4,840,145

PROCESS AND A DEVICE FOR CLEANING INNER OR OUTER WALLS OF VERTICALLY EXTENDING OR INVERTED TUBES OF HEAT EXCHANGERS

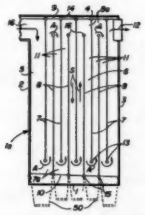
Frohmut Vollhardt, Oberhausen, and Hans Krämer, Dinslaken, both of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette GmbH, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 195,117

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621850; Sep. 29, 1986, 3632982

Int. Cl.[4] F22B *37/18, 37/48*

U.S. Cl. 122—379 **7 Claims**



1. A process for cleaning the inner and outer walls of vertical and inverted tubes of heat exchangers, particularly of the tubes of trash incinerators waste heat boiler, comprising imparting a kinetic energy to the tubes in a longitudinal direction and then stopping the tubes abruptly, said tube walls including a horizontally extending header and wherein the header is engaged and lifted upwardly and then permitted to fall downwardly.

4,840,146

MULTIPLE THROTTLE MECHANISM FOR INTERNAL COMBUSTION ENGINES

Shozo Yanagisawa, Toukai; Sigeo Tamaki, and Isamu Ishizawa, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,659

Claims priority, application Japan, May 11, 1987, 62-112316

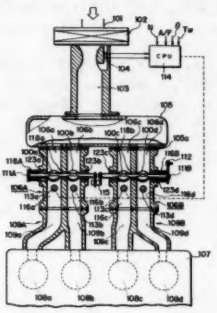
Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 MB **6 Claims**

1. A multiple throttle mechanism for internal combustion engines comprising a main air intake passage, a plurality of intake manifold passages connected to the downstream side of main air intake passage and communicating with engine cylinders, respectively, a plurality of throttle valves provided in said intake manifold passages, respectively, and fuel injectors having fuel injection holes opened to said intake manifold passages downstream of said throttle valves, respectively, characterized by

a pair of intake manifold blocks separated from each other and each having at least two parallel passages formed therethrough and a wall portion separating thereby said adjacent parallel passages, said parallel passages each being a part of said intake manifold passage and having said injection hole;

a pair of throttle shafts arranged in an axial direction, said throttle shafts each crossing said parallel passages, passing through a through hole formed in said wall portion of said intake manifold block and supported on said intake manifold block, said throttle valves being mounted on said throttle shafts so that said throttle valves are operated



simultaneously to control the cross sectional area of each said parallel passage; and

means, including air gap defined between said through hole and said throttle shaft, for fluidly interconnecting said parallel passages in each of said intake manifold blocks and passing air from said main air intake passage into said parallel passages downstream of said throttle valves by by-passing said throttle valves, thereby providing desired fuel air ratio for each said engine cylinder during idling of the engine.

4,840,147

COMBUSTION CHAMBER OF A TWO-STROKE ENGINE

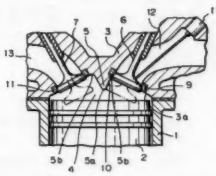
Toshio Tanahashi, Susono; Norihiko Nakamura, Mishima; Hiroshi Noguchi, Gotenba; Kenichi Nomura, Susono; Toyokazu Baika, Susono; Masanobu Kanamaru, Susono; Tatsuo Kobayashi, Susono; Hideo Nagaosa, Susono; Kazuhiro Ito, Susono; Toshio Ito, Susono, and Kouichi Nakae, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 5, 1988, Ser. No. 215,420

Claims priority, application Japan, Jul. 9, 1987, 62-169684; Nov. 17, 1987, 62-288390; Apr. 27, 1988, 63-102659

Int. Cl.[4] F02B *75/02*

U.S. Cl. 123—65 VD **22 Claims**



1. A two-stroke engine comprising:

an engine body including a cylinder head having an inner wall;

a piston reciprocally movable in said engine body, the inner wall of said cylinder head and a top face of said piston defining a combustion chamber therebetween;

at least one intake valve arranged on the inner wall of said cylinder head;

at least one exhaust valve arranged on the inner wall of said cylinder head;

masking means arranged between said intake valve and said exhaust valve to mask a valve opening formed between a valve seat and a peripheral portion of said intake valve, which is located on said exhaust valve side, for the entire time for which said intake valves is open.

4,840,148

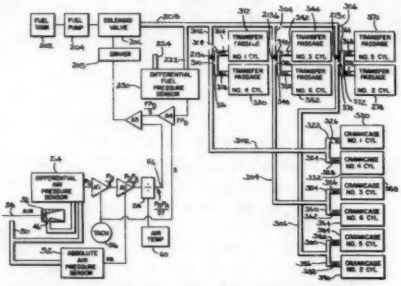
TWO CYCLE ENGINE WITH LOW PRESSURE CRANKCASE FUEL INJECTION

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 95,356, Sep. 10, 1987, Pat. No. 4,750,464, which is a continuation-in-part of Ser. No. 25,270, Mar. 12, 1987, Pat. No. 4,763,626. This application Apr. 6, 1988, Ser. No. 178,383

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 A **14 Claims**



1. A two cycle internal combustion engine comprising:

a piston reciprocal in a cylinger between a crankcase and a combustion chamber;

air intake means supplying combustion air to said crankcase;

fuelll supply means including a fuel pump supplying fuel to said crankcase through a fuel line, without a carburetor, without a high pressure fuel pump, without high pressure fuel injectors, and without a constant fuel pressure regulator;

means sensing the amount of combustion air supplied to said crankcase;

means sensing the flow velocity of fuel through said fuel line comprising a restriction orifice in said fuel line producing a fuel pressure drop indicating fuel flow velocity;

a conduit connected between said crankcase and said fuel line downstream of said restriction orifice and passing pressurized air-fuel mixture from said crankcase to said fuel line to improve fuel atomization;

means in said fuel line upstream of said restriction orifice and responsive to said means sensing the amount of combustion air and said means sensing flow velocity of fuel, to control the amount of fuel supplied through said fuel line according to said amount of combustion air and said fuel flow velocity.

4,840,149

CAMSHAFT APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Hiroya Fujita, Anjo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 1, 1988, Ser. No. 214,730

Claims priority, application Japan, Jul. 7, 1987, 62-103297[U]

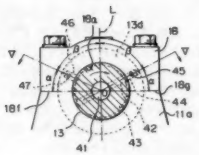
Int. Cl.[4] F01L *1/04;* **F01M** *1/06*

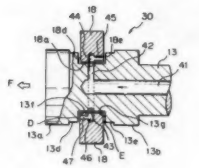
U.S. Cl. 123—90.31 **5 Claims**

1. A camshaft apparatus provided for an internal combustion engine having two cylinder heads disposed in parallel to each other in such a manner that a front portion of one of said cylinder heads is disposed near a rear portion of one of the other of said cylinder heads, said two cylinder heads being provided with at least one support portion projecting therefrom and at least one bearing cap fixed on said support portion to define a cylindrical supporting hole therebetween, said camshaft apparatus comprising:

first camshafts disposed on each of said two cylinder heads, respectively, each of said first camshafts being driven by said engine to rotate in the same direction;

second camshafts disposed on each of said two cylinder heads, respectively, each of said second camshafts being rotatably supported by said cylindrical supporting hole, and formed with at least two large diameter portions having diameters larger than said supporting hole, one of said at least two large diameter portions being located on one side of said bearing cap and the other of said at least





two large diameter portions being located on the other side of said bearing cap to define first and second lubricating gaps between said large diameter portions and said bearing cap;

helical gears mounted on said first and second camshafts, respectively, said helical gears mating with each other to transmit a rotation of said first camshafts to said second camshafts; and

means for supplying lubricating oil to said first and second lubricating gaps, said oil supply means supplying different amounts of oil to said first and second lubricating gaps, respectively, to produce a pressure differential between said first and second lubricating gaps and thereby urge said camshaft in a predetermined direction.

4,840,150

VALVE-ACTUATING LEVER FOR INTERNAL COMBUSTION ENGINES

Werner Kotzab, Schweinfurt, and Horst Zielke, Winnenden, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,671

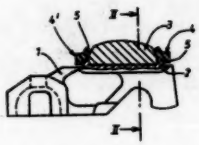
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715758

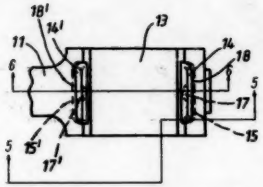
Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.39 **5 Claims**

1. A valve-actuated lever, comprising slide means disposed in a rectangular groove of a lever means, the slide means being form-lockingly retained in the lever means by at least two strip means within the area of forward and rear edges of the slide means, the forward and rear edges being formed relative to the central axis of a cam shaft, the lever means being provided with projections within the area of the rectangular groove, the slide means having a pair of recesses, the respective recesses

being formed in the forward and rear edges of the slide means and adjacent to forward and rear edges of the groove, wherein the strip means are at least equal in length to the respective recesses, and project into cavities formed in the lever means beneath the respective forward and rear edges of the groove,





and the strip means include at least one of a fiber-reinforced plastic material, ceramic-powder containing plastic material and glass microballs containing material, each with a temperature resistance of at least 150° and form-lockingly filling the pair of recesses and respective cavities.

4,840,151

SEALED-TYPE LASH ADJUSTER

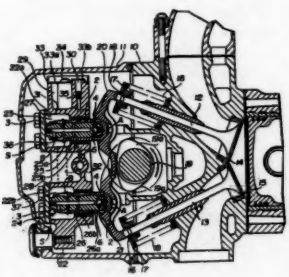
Masayasu Sakata, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 61,867

Claims priority, application Japan, Jun. 14, 1986, 61-138711

Int. Cl.[4] F01L 1/24

U.S. Cl. 123—90.43 **1 Claim**



1. A sealed-type lash adjuster comprising:

cylindrical body means having

a bottom;

plunger means

slidably received in said body means and

forming a high pressure chamber for sealing hydraulic oil between an inner surface of said bottom portion of said body means and said plunger means;

diaphragm means

mounted between an open end of said body means and said plunger means and forming a reservoir chamber for the hydraulic oil to be supplied to said high pressure chamber,

said diaphragm means being formed of flexible material, with at least part of the thickness thereof being formed of a fluorine-bonded layer extending over the entirety of said diaphragm means;

holder means including

bushing means, including an interior surface having an annular channel therein, for slideably receiving said cylindrical body means with said bottom portion of said body means generally facing toward a combustion chamber means and engageable with valve rocker means, and said diaphragm means and said open end of said body means generally facing away from said combustion chamber means;

fluid reservoir means for storing fluid lubricant; and conduit means in fluid communication with said fluid reservoir means and said annular channel in said bushing means, for conducting fluid lubricant from said fluid reservoir means to said annular channel in said bushing means; and

mounting means operable to secure said holder means with said cylindrical body means being interposed between said combustion chamber means and said diaphragm means.

4,840,152

V-TYPE VERTICAL ENGINE

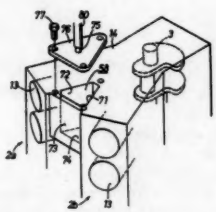
Yoshimi Watanabe; Shinichi Miyakoshi, and Kenichi Goto, all of Wako, Japan, assignors to Honda Giken Gokyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1987, Ser. No. 49,305

Claims priority, application Japan, May 16, 1986, 61-112123; May 16, 1986, 61-073655[U]; May 16, 1986, 61-073656[U]

Int. Cl.[4] F02B 75/22

U.S. Cl. 123—52 MV **7 Claims**



1. A V-type vertical engine having a crank shaft extending vertically and a pair of cylinder banks forming a certain angle therebetween, comprising:

intake ports which are located adjacent to the internal sides of the cylinder banks and communicated with combustion chambers of the engine by way of intake valves;

intake tubes which are connected to the intake ports and, at least in part thereof, extend along a central line between the two cylinder banks away from the crank shaft of the engine;

exhaust ports which are located adjacent to the external sides of the cylinder banks and communicated with the combustion chambers of the engine by way of exhaust valves;

exhaust passages which, at least in part thereof, extend along a cylinder axial line towards the crank case;

a cooling water passage consisting of a central conduit extending in a central plane located between the two cylinder banks in parallel with the crank shaft of the engine; and

wherein a thermostat valve is accommodated in a thermostat valve chamber defined by a chamber member which is supported by a pair of transfer conduits extending from upper surfaces of the two cylinder banks, the thermostat

valve chamber being communicated with water jackets in the cylinder banks by way of the transfer conduits as well as with the central conduit.

4,840,153

HYDRAULIC LASH ADJUSTER

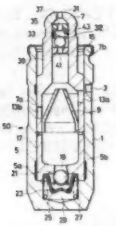
Akira Aida, and Toshihiro Ikeda, both of Takasaki, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,121

Claims priority, application Japan, Oct. 23, 1987, 62-266538

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 **17 Claims**



1. A hydraulic lash adjuster for adjusting the valve clearance of an engine valve and for supplying oil to lubricate a surface, comprising:

a cup-shaped body having an oil introducing port and an inner chamber;

a plunger assembly axially movably fitted in said inner chamber and including a partition wall which divides said inner chamber transversely to the chamber axis into first and second compartments and which has a hole providing fluid communication between said first and second compartments, an oil outlet port at the top of said assembly, and an oil supply inlet provided in a peripheral wall of said assembly to communicate with said oil introducing port;

a high pressure chamber defined in said first compartment of said inner chamber and having first valve means for seating on said hole of said partition wall;

a reservoir chamber defined in said second compartment and being fluid communication with said high pressure chamber by way of said hole of said partition wall;

a separator provided in said plunger assembly and dividing said reservoir chamber into two spaces, an outer surface of said separator and a substantially opposed inner surface of said plunger assembly together defining a space which converges in the direction of said oil outlet port; and

second valve means provided in said plunger assembly in fluid communication with said reservoir chamber and said oil outlet port for allowing oil introduced through said oil introducing port and said oil supply inlet to flow therethrough to be ejected from said oil outlet port but preventing outside air from being drawn into said reservoir chamber through said oil outlet port when the pressure of the outside air exceeds the pressure of the introduced oil.

4,840,154

TUBULAR CERAMIC BODY FOR GAS PASSAGES IN CYLINDER HEAD OF INTERNAL COMBUSTION ENGINE

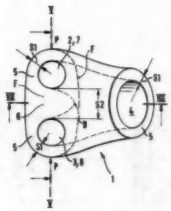
Dieter Fingerle, Hochdorf, and Wolf-Dieter Gundel, Pliezhausen-Ruebgarten, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,132

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706208

Int. Cl.[4] F01N *7/14, 7/16, 7/18*

U.S. Cl. 123—193 H **7 Claims**



1. A tubular ceramic body for gas passages in a cylinder head of an internal combustion engine, comprising a tubular piece having an opening; two separate tubular portions each having an end side and provided with an opening at said end side, said tubular portions merging into said tubular piece in a transition region; and a connection provided between said tubular portions at least in said transition region of said tubular portions into said tubular piece, said ceramic body being formed as a one-piece member produced in a single sintering process from a single material, and said connection of said tubular portions being formed by a common wall.

4,840,155

FUEL INJECTION PUMP

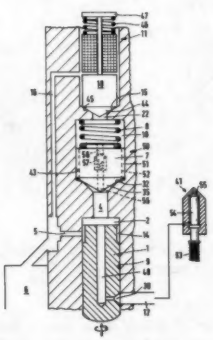
Anton Karle, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 187,082

Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715614

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—300 **11 Claims**



1. In a fuel injection pump for internal combustion engines, comprising housing means defining a pump working chamber; at least one pump piston movably guided in said working chamber; a fuel injection valve; means to connect said chamber

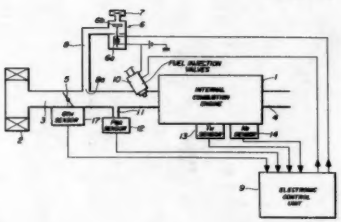
to said fuel injection valve during an advancement stroke of said pump piston to open or close said fuel injection valve, said housing means including a first unloading passage connected to said chamber, said housing means further including an unloading chamber connectable to said first unloading passage, and a second unloading passage connected to said unloading chamber to unload the latter; a controlling member controlling said first unloading passage to close or open the latter; a restoring spring positioned in said unloading chamber and biasing said controlling member in a direction of closing, the improvement comprising said first unloading passage having a valve seat with which said controlling member cooperates as a valve closing member, said controlling member being formed so that an opening pressure thereof is higher than the opening pressure of said fuel injection valve, said valve seat and said second unloading passage being connected with one another in an unthrottled manner; and a further valve operating so that in a first operating range said second unloading passage is open at the beginning of the advancement stroke of said pump piston by said further valve enabling a pre-injection of fuel, closed after opening of said controlling member for starting a main fuel injection and again opened for ending at the beginning of the advancement stroke of said pump piston for starting a fuel injection without preinjection and finally opened again for ending the fuel injection.

4,840,156

INTAKE AIR QUALITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT TERMINATION OF FUEL CUT OPERATION

Akihiro Yamato, Shiki, and Makoto Hashiguchi, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 615,050, May 29, 1984, abandoned. This application Dec. 24, 1987, Ser. No. 139,068
Claims priority, application Japan, Jun. 16, 1983, 58-108239
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—339 **3 Claims**



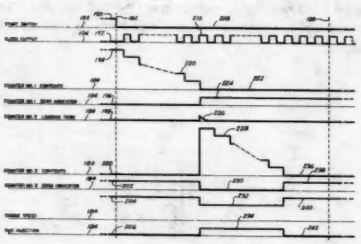
1. A method of controlling the quantity of intake air being supplied to an internal combustion engine, said engine having an intake passage, a throttle valve arranged in said intake passage, and means for increasing the quantity of intake air being supplied to said engine by a required amount in response to operating conditions of said engine, said method comprising the steps of: (a) interrupting the fuel supply to said engine at deceleration of said engine with said throttle valve fully closed; (b) determining whether or not a predetermined condition that the engine rotational speed is lower than a predetermined low value that is higher than a normal idle speed of the engine is satisfied for terminating the interruption of the fuel supply to said engine, which is carried out at deceleration of said engine with said throttle valve fully closed; (c) detecting a rate of decrease in the rotational speed of said engine; (d) comparing the detected rate with a predetermined value; and (e) increasing the quantity of fuel being supplied to said engine for a limited period of time, and at the same time actuating said intake air quantity increasing means for said limited period of time to supply a supplementary quantity of intake air, immediately after it is determined that said predetermined condition is satisfied, while at the same time the detected rate of decrease is larger than said predetermined value.

4,840,157

ENGINE SPEED CONTROL CIRCUIT FOR DRAG RACING

Robert E. Furrow, P.O. Box 338, Hinton, Okla. 73047

Filed May 20, 1988, Ser. No. 196,744
Int. Cl.[4] F02D *31/00*
U.S. Cl. 123—352 **16 Claims**



1. A circuit for temporarily reducing the engine speed of a racing car during a drag race, comprising:

a clock for providing a sequence of timed electrical pulses during the drag race;

a first down counter electrically connected to the clock for counting down from a first preselected number entered into the first down counter in response to pulses provided by the clock;

a second down counter electrically connected to the clock for counting down from a second preselected number entered into the second down counter in response to pulses provided by the clock wherein the second down counter is characterized as having a zero count indicator terminal providing the alternative voltage states corresponding to a counting and non-counting condition of the second down counter;

starting means for initiating a countdown of the first down counter from the first preselected number simultaneously with the start of a drag race;

means electrically connecting the down counters for loading the second preselected number into the second down counter at such time that the count in the first down counter reaches zero;

speed adjustment means for adjusting the speed of the racing car engine in response to a speed control signal; and

means, connected between the speed adjustment means and the zero count indicator terminal of the second down counter, for providing the speed control signal in response to a selected voltage state at said zero count indicator terminal.

4,840,158

IGNITION TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Satosi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,463
Claims priority, application Japan, Apr. 30, 1987, 62-109329
Int. Cl.[4] F02P *5/14*
U.S. Cl. 123—419 **4 Claims**

1. An ignition timing control apparatus for an internal combustion engine which comprises:

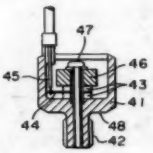
a non-resonance type acceleration sensor which has a piezoelectric element as a vibration detecting element for said engine and a metric screw portion to be engaged with the same;

a frequency filter having its central frequency in a range of from 10 KHz to 20 KHz and its band width of 1 KHz or higher, which selectively detects a knocking signal component contained in an output from said sensor;

a gate means for interrupting a noise which disturbs detection of the knocking signal contained in an output signal from said frequency filter;

a noise level detector for detecting, from an output from said gate means, the level of a mechanical vibration noise of the engine other than the knocking signal;

a comparing and integrating means for integrating a pulse signal obtained by comparing an output voltage from said noise level detector with an output voltage from said gate means;



a rotation signal generator for generating an ignition signal in response to a predetermined ignition advance angle characteristic;

a waveform-shaping circuit for shaping the waveform of the output of said rotation signal generator and for controlling the closing angle of an ignition coil;

a phase shifter for shifting with delay of time the output signal of said waveform-shaping circuit in response to the output of said comparing and integrating means so that a switching circuit for turning-on and off said ignition coil is actuated; and

a gate timing controller triggered by the output of said phase shifter so as to interrupt the ignition noise by closing the gate of said gate means for a predetermined time from the time of ignition.

4,840,159

APPARATUS FROM CONTROLLING AMOUNT OF INTAKE AIR TO ENGINE

Osamu Matsumoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,051

Claims priority, application Japan, Feb. 26, 1987, 62-29303; Feb. 26, 1987, 62-29304

Int. Cl.[4] F02M *23/00*

U.S. Cl. 123—585 **4 Claims**

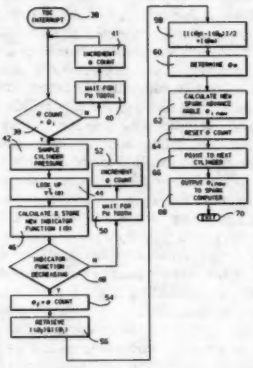
1. An apparatus for controlling the amount of intake air to an engine, comprising:

a throttle body forming a part of an air intake passage for said engine, said throttle body being oriented so that the inside of said throttle body defines a horizontal passage;

a throttle valve disposed in said throttle body;

a second valve coupled to the bottom of said throttle body and acting to control the amount of auxiliary air flowing through a bypass passage which bypasses said throttle valve; and

at least one guide passage formed in said throttle body and connected with said bypass passage, said guide passage



having an open end in said horizontal passage disposed above the center line of said horizontal passage.

4,840,160

VALVE CONTROL DEVICE

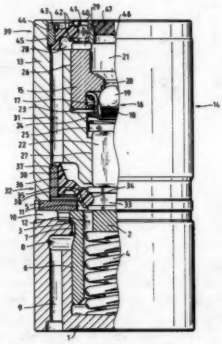
Michael Zipprath, Herzogenaurach, and Dieter Schmidt, Nuremberg, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 154,802

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704743

Int. Cl.[4] F02M *38/00*

U.S. Cl. 123—467 **8 Claims**



1. A control device for a valve arranged in a fuel injection line of an internal combustion engine and closable to build up an injection pressure at an injection nozzle wherein a play adjusting element is arranged between a valve body of the valve and a drive element, characterized in that the adjusting element (**14**) is provided with two pistons (**15,22**) guided in a housing (**13**), the first piston (**15**) is acted upon by the drive element and the second piston (**22**) acts upon the valve body, and the housing (**13**) accommodates between the pistons (**15,22**) an oil-containing pressure chamber (**23**) which is fluidly isolated in relation to the valve (**1,2**) and accommodates a pressure spring (**24**) acting upon pistons (**15,22**).

4,840,161
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

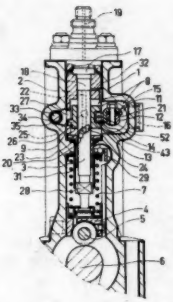
Wolfgang Eckell, Leonberg; Josef Guentert, Gerlingen; Walter Haefele, Fellbach; Manfred Kraemer, Schwieberdingen; Uwe Kuhn, Riederich, and Johann Warga, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,044

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724662

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—500 **20 Claims**



1. A control device for axial displacement of at least one control slide relative to a pump piston in a fuel injection pump for internal combustion engines in which said control device comprises:

a rotatable shaft,

a connecting element secured to said rotatable shaft,

an adjusting means disposed on said connecting element secured to said rotatable shaft, said adjusting means including a radially projecting cylindrical stud,

a slide shoe secured on said cylindrical stud of said adjusting means free of any axial displacement, said slide shoe engages a cross groove disposed on said control slide in order to convert a rotational motion of said rotating shaft into a reciprocating motion of said control slide,

said cylindrical stud including a free end that forms an enlarged head **(44, 144, 244)** which engages one face end of said slide shoe **(43, 143, 243)** from behind to provide very little axial play by which said slide shoe is secured in its working position.

4,840,162
FUEL INJECTION PUMP

Andre Brunel, St Genis Laval, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

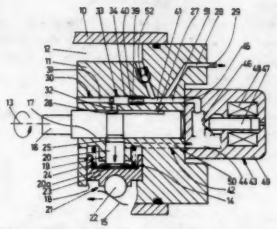
Filed May 10, 1988, Ser. No. 197,072

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719831

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **20 Claims**

1. A fuel injection pump for internal combustion engines having a pump interior, at least one pump piston defining a pump work chamber, said pump piston adapted to be driven reciprocatingly to execute an intake stroke and a supply stroke, wherein upon said intake stroke said pump work chamber is filled with fuel via an inflow line from a fuel supply chamber in said pump interior, and upon the supply stroke the fuel is pumped out of the pump work chamber to an adjoining injection nozzle, an electric switching valve which controls a duration of pumping, said electric switching valve being disposed in a relief line leading from said pump work chamber to a relief chamber in said pump interior, and said switching valve on closing defines the supply onset and by opening defines the end of supply, a non-return valve **(33; 133; 233)** having an opening direction toward said pump work chamber **(25)** being disposed in an inflow line **(30)** between said fuel supply chamber **(12)** and said pump work chamber **(25)**, said non-return valve including a valve element, a valve closing spring **(40)** for urging said valve element **(37)** in a closing direction and a fuel-fillable



control chamber **(39)** adapted, when filled with fuel, to lock said valve element **(37)** in its closing position, said control chamber **(39)** communicating with a section **(52)** of a relief line **(42)** located between said switching valve **(43)** and the relief chamber in the pump interior, and said relief line **(42)** is closed off toward the relief chamber **(12)** by a check valve **(52)** so oriented that its opening direction is toward the relief chamber.

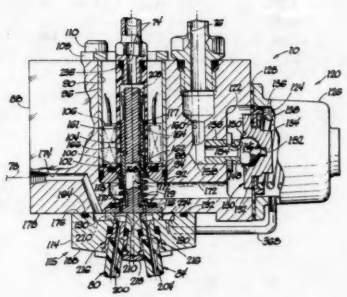
4,840,163
ELECTROMAGNET, VALVE ASSEMBLY AND FUEL METERING APPARATUS

Daniel E. Alsobrooks, Flat Rock; Hansueli Bart, Mt. Clemens; Richard Chauvin, Clawson; Thomas A. Horn, East Detroit; John H. Merte, Sterling Heights, all of Mich.; Gerhard Mesenich, Bochum, Fed. Rep. of Germany, and Donna M. Mitts, Canton Township, Wayne County, Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Jan. 8, 1987, Ser. No. 1,420

Int. Cl.[4] F02M *39/00;* **F16K** *11/14*

U.S. Cl. 123—533 **59 Claims**



1. An improvement in a fuel supply system of an internal combustion engine, having a single fuel metering valve assembly supplying fuel to a plurality of cylinders of said engine, each of said cylinders having intake port means at one end of an individual fuel line connected for the flow of fuel thereinto, the opposite end of each fuel line being operatively connected to the fuel metering valve assembly, the fuel metering valve assembly having a number of fuel discharge passages corresponding in number to the number of fuel lines, air chamber means continguous to said discharge passages for receiving superatmospheric air therein, and means connecting respective ones of said fuel lines to respective ones of said discharge passages across said air chamber means and said superatmos-

pheric air therein, the fuel discharged from said fuel discharge passages and said superatmospheric air combining to form a fuel-air mixture of atomized fuel and air, whereby said fuel-air mixture flows through the fuel lines for an equal distribution to each cylinder, wherein said improvement comprises said fuel metering valve assembly comprising electromagnetic motor means, wherein said electromagnetic motor means comprises stationary magnetic body means at least in part comprised of magnetic material, said magnetic body means being formed as to have an axis of revolution and further comprising transverse wall means, pole piece means situated as to be centrally of and stationary with respect to said magnetic body means, electrical coil means effective upon energization thereof to create a magnetic flux loop, armature means, said transverse wall means extending generally transversely of said axis of revolution and effective to at least in part receive said armature means, said armature means being moved into contact with said pole piece means upon energization of said coil means, said magnetic body means and said pole piece means functioning to provide a path for said flux loop about said electrical coil means upon energization thereof, wherein said path of said flux loop is comprised of a non-moving portion of said electromagnetic motor means and of a moving portion of said electromagnetic motor means, wherein said moving portion of said electromagnetic motor means comprises said armature means, wherein said non-moving portion of said electromagnetic motor means comprises said pole piece means and said stationary magnetic body means, and additional means forming a magnetic interruption in said non-moving portion of said electromagnetic motor means for enhancing flux leakage thereby reducing the flux decay time in said flux loop, wherein said armature means comprises a valving member for alternatingly permitting and terminating the flow of said fuel through said fuel discharge passages, and wherein said additional means forming said magnetic interruption comprises gap-forming means of non-magnetic material in said non-moving portion, and wherein said gap-forming means of non-magnetic material is at most only partly in said transverse wall means.

4,840,164

METHOD AND APPARATUS FOR SUPERCHARGING INTERNAL COMBUSTION ENGINES

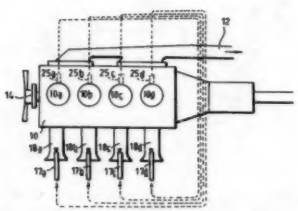
Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, England

Filed Jan. 19, 1988, Ser. No. 145,059

Claims priority, application United Kingdom, Jan. 24, 1987, 8701578

Int. Cl.[4] F02B *29/02, 47/08*

U.S. Cl. 123—559.1 **11 Claims**



1. A method of supercharging a multi-cylinder internal combustion engine comprising, tapping exhaust gases from each of the cylinders of the engine towards the end of its expansion stroke to provide a high velocity pulsed jet of gas, injecting the high velocity pulse jet of gas from one cylinder into a mixing chamber connected to an inlet port of another cylinder, said mixing chamber containing air so that the momentum exchanged between the jet of gas and the air will accelerate the air to provide a pulsed induction charge of the air, said pulsed induction charge being delivered to said other cylinder towards the end of the induction stroke of said other cylinder.

4,840,165

CONTINUOUS SPARK ELECTRONIC IGNITER

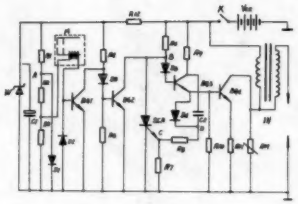
Wang Hua, Chengdu, China, assignor to Chengdu Aircraft Corporation, Chengdu, China

Filed Nov. 16, 1987, Ser. No. 121,213

Claims priority, application China, Nov. 26, 1986, 86107987

Int. Cl.[4] F02P *3/04, 7/067*

U.S. Cl. 123—606 **6 Claims**



1. A continuous spark electronic ignition, comprising:

a. magnetic pulse generator means for providing an electric pulse signal in accordance with the rotational position of an engine crank,

b. signal amplifying circuit means having an input connected to an output of said magnetic pulse generator means for amplifying said electric pulse signal,

c. voltage stabilizing circuit means having an input connected to a power supply and an output connected to said magnetic pulse generator means and said signal amplifying circuit means for providing stabilized input voltages to said magnetic pulse generator means and said signal amplifying circuit means, and

d. continuous pulse generating circuit means having an oscillation control input connected to an output of said signal amplifying circuit means for generating a corresponding continuously pulsed output voltage signal in response to each pulse input from said signal amplifying circuit means,

said magnetic pulse generator means including a permanent magnet, a first magnetic flux conductor and a second magnetic flux conductor connected respectively to opposite poles of said permanent magnet and defining a normally closed first magnetic circuit and a normally open second magnetic circuit, said first magnetic circuit being closed through a magnetic flux attracting gap of from about 0.1 mm to about 5 mm defined between the closest parts of said first and second magnetic flux conductors, said second magnetic circuit having a magnetic detecting surface spaced from said first magnetic circuit, and a coupling coil wound about a portion of one of said first and second magnetic flux conductors in said second magnetic circuit and between said first magnetic circuit and said magnetic detecting surface,

said continuous pulse generating circuit means including directly coupled two-stage transistor switching circuit means having an output connected to an ignition coil and a resistance connecting the emitter of a second stage transistor of said switching circuit means to ground, oscillation maintaining and control circuit means including a three-terminal semiconductor switching device having a controlled-current input connected to a first stage transistor bias circuit of said switching circuit means for causing said switching circuit means to oscillate between enabled and disabled states, trigger signal circuit means having an input connected to the emitter of one of said first and second stage transistors of said switching circuit means and an output connected to a control input of said three-

terminal semiconductor switching device for causing said three-terminal semiconductor switching device to conduct and disable said switching circuit means and to stop conducting after said switching circuit means is disabled, and trigger signal continuous current circuit means having an input connected to the collector of said first stage transistor of said switching circuit means and an output connected to an input of said trigger signal circuit means for causing said three-terminal semiconductor switching device to remain conductive for a period of time after said switching circuit means is disabled.

4,840,166

SHOCK WAVE SOURCE WITH INCREASED DEGREE OF EFFECTIVENESS

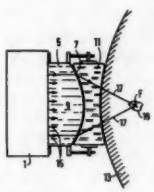
Georg Naser, Zirndorf; Helmut Reichenberger, Eckental, and Hubert Schwark, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,334

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1986, 3610837

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **3 Claims**



1. A shock wave source, particularly useful for a lithotriptor, comprising:

a pressure source for the generation of a pressure wave pulse having a direction of propagation;

a coupling body having an output adapted to be coupled to a body of a patient, said coupling body comprising material having an acoustic impedance value matched to that of the body of the patient;

a seal diaphragm for acoustically coupling said pressure wave pulse into said coupling body;

said seal diaphragm having a front wall disposed at a distance, in the direction of propagation of the pressure wave pulse, from the pressure source and in contact with said coupling body;

said seal diaghragm and said pressure source enclosing a space containing a substance having a B/A nonlinearity parameter value higher than that of water and an acoustic impedance value which is less than or equal to that of water;

said substance being acoustically coupled to both the pressure source and the seal diaphragm; and

said front wall of said seal diaphragm being shaped so as to cause focusing of the pressure wave pulse generated by the pressure source.

4,840,167

RESPIRATOR AND A METHOD OF UTILIZING THE RESPIRATOR TO PROMOTE BLOOD CIRCULATION

Sven G. Olsson, Soedra Sandby, and Björn Jonson, Lund, both of Sweden, assignors to Siemens Elema AB, Sweden

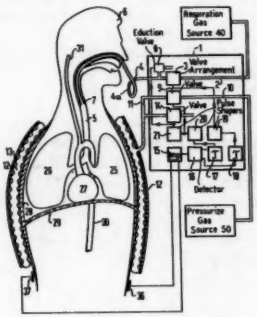
Division of Ser. No. 908,949, Sep. 16, 1986, Pat. No. 4,676,232, Continuation of Ser. No. 552,776, Nov. 17, 1983, abandoned.

This application Apr. 15, 1987, Ser. No. 38,494

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242814

Int. Cl.[4] A61H *31/00*

U.S. Cl. 128—28 **14 Claims**



1. A respirator connectable to the lungs of a patient comprising:

means for applying a respiratory gas to the lungs of said patient;

means for restricting expansion of a substantial portion of the chest and abdomen of the patient by applying a continuous uniform non-deforming, volume limiting force to the chest and abdomen opposing expansion of the chest and abdomen; and

control means for synchronizing the operation of said means for applying a respiratory gas and said means for restricting expansion so that the respiratory gas is applied at a point in the heart cycle of the patient such that the uniform force creates a pressure rise around the heart coinciding with the contraction phase of the heart.

4,840,168

COMBINATION ARM SPLINT AND FINGER SUPPORT MEANS

Robert Lonardo, 680 Capri Blvd., Treasure Island, Fla. 33706

Filed Aug. 11, 1988, Ser. No. 231,223

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] A61F *5/10*

U.S. Cl. 128—77 **8 Claims**

1. In combination,

a finger support,

a forearm and wrist splint, comprising

an elongated base strip having a longitudinal axis adapted to conform to the underside of a patient's forearm, said base strip having first and second layers, each having forward and rearward ends; said base strip being folded at its upper forward end and extending rearwardly with said second layer dwelling coextensively with said first layer,

a hand support portion formed at said forward end of said first layer,

connecting means detachably connecting the rearward ends of said first and second layers,

a slot means formed between said first and second layers adjacent said forward ends, said slot means extending transversely with respect to the longitudinal axis of said base strip and being adapted to transversely slidably receive said finger support, and

means for detachably securing said finger support within said slot means.

4,840,169

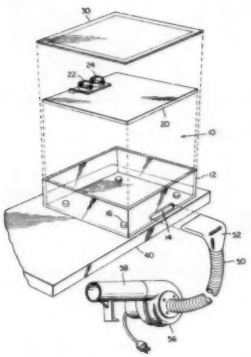
VENTILATION SYSTEM FOR ARTISTS

Fred Folsom, 908 Hudson Ave., Takoma Park, Md. 20912

Continuation of Ser. No. 929,836, Nov. 13, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,521

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—863 **6 Claims**



1. A paint ventilation enclosure for an artist when working with paints and solvents, said paint ventilation enclosure comprising:

a transparent housing having a base and sidewalls, said housing being transparent to aid in viewing paint located in said housing through said sidewalls, said housing being normally open at its top to communicate freely with the atmosphere and to gain access to paints located in said housing,

a transparent palette located in said housing for holding paints, said palette being continuously flat between said sidewalls of said housing,

means for supporting said palette above said base of said housing and below the top of said housing,

peripheral edges of said palette being spaced inwardly from said sidewalls of said housing to allow free passage of air from above said palette to below said palette in a space defined between said peripheral edges and said sidewalls,

vent means located in a sidewall of said housing above said base and below said palette for drawing vapors and fresh atmosphere downwardly from above said palette and evacuating the vapors and atmosphere out of said housing, and

lid means removably mounted on top of said housing for allowing free communication of atmosphere with the interior of said housing when access to the interior of said housing is required in a first position of said lid and for sealing the interior of said housing when said lid is in a second position to prevent escape of vapors from said housing.

4,840,170

SELF-RESCUER APPARATUS

Klaus-Dieter Dahrendorf; Volker Huennebeck, and Wilfried Hoffman, all of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 824,775, Jan. 30, 1987, abandoned. This application Jul. 13, 1987, Ser. No. 72,526

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503628

Int. Cl.[4] A62B *7/08*

U.S. Cl. 128—202.26 **4 Claims**

1. In a self contained personal breathing apparatus for emergency use having a breathing bag with an external surface, the apparatus including a canister, a supply of oxygen-evolving chemical in the canister which is adapted to react with carbon dioxide and water vapor in exhaled breath to generate oxygen and heat as a byproduct, the breathing bag being composed of a flexible material, wherein the a canister is partially disposed therein, said canister including a first port exterior of said bag and a second port in fluid communication with said bag such that the generated oxygen collects therein, a mouthpiece, a breathing tube operably connected between the mouthpiece and the first port, such that exhaled breath is provided to the canister through the breathing tube and oxygen generated in the canister is provided for inhaled breath back through the tube, and carrying strap means to permit portability of the apparatus by a user, the improvement comprising:

a pair of spaced part loops that are aligned and affixed on the external surface of the breathing bag;

an essentially flat first plate having a substantially rectangular configuration with a first and second edge, said first and second edge being essentially parallel and opposite each other on the plate;

a first flanged protrusion affixed to the first edge, and a second flange protrusion affixed to the second edge and oppositely affixed to the first flanged protrusion, said first and second flanged protrusions being sized to removably engage with the loops on the breathing bag so the first plate is held by the loops and rests against the external surface of the breathing bag;

a second essentially flat plate also having a substantially rectangular configuration with a first and second edge;

a separation means disposed normal to and interposed transversely between said first and second plates to maintain a passage therebetween so air can flow therethrough and provide thermal insulation due to convection between the first plate and the second plate so the amount of heat byproduct is minimized from reaching the second plate and thus a user is protected therefrom, the second plate positioned by the separation means so it is parallel to the first plate with the first edge of the first plate essentially

aligned and parallel to the first edge of the second plate; and

a first wall and a second wall being substantially parallel to each other, said first wall joining the first edge of the first plate to the first edge of the second plate, said second wall joining the second edge of the first plate with the second edge of the second plate to define a substantially rectangular configuration for the passage within the separation means, each wall hingeably connected along their respective edges to the respective plates.

4,840,171

OXYGEN SUPPLY UNIT HAVING AN OXYGEN GENERATOR

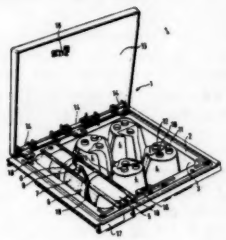
Holmer Röhling, Reinfeld; Frank Schulz, Lübeck, and Siegfried Preininger, Stockelsdorf, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 204,873

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719427

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.18 **5 Claims**



1. An oxygen supply unit comprising:

an openable housing having a rectangular reinforcing frame having four interconnected side walls;

a strut defining a longitudinal axis and having first and second ends;

releasable attachment means for releasably attaching said first and second ends of said strut to respective ones of two of said side walls of said reinforcing frame;

at least one oxygen mask disposed in said housing;

an elongated oxygen generator for supplying oxygen to said oxygen mask when said oxygen supply unit is in use;

said oxygen generator defining a longitudinal axis; and,

holding means for holding said generator only to said strut so as to cause said axes to extend in the same direction and so as to prevent vibration from being transmitted directly from said generator to said housing.

4,840,172

DEVICE FOR POSITIONING AN ENDOTRACHEAL TUBE

Scott D. Augustine, 4761 Olive St., San Diego, Calif. 92105, and Douglas J. Augustine, Box 37, Sandstone, Minn. 55072

Continuation of Ser. No. 904,011, Sep. 4, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 119,300

Int. Cl.[4] A61M *16/00*

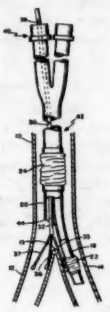
U.S. Cl. 128—207.14 **9 Claims**

1. A device for positioning an endotracheal tube in a trachea of a patient to be intubated, comprising:

an elongate flexible positioning member with an axis, a closed distal end and a proximal end;

three elongated flexible extensions attached to said distal end and forming a tripodal structure with a vertex attached to and opening away from said distal end, said tripodal structure having a base which describes a circle having a predetermined diameter which is at least equal to the trachea diameter of the trachea of a patient to be intubated; and

bias means in each of said extensions and acting solely between said extension and said distal end for moving said extension from a closed position along said axis, through



an angle of less than 90°, to a respective leg position in said tripodal structure and for spring-biasing said extension to said leg position.

4,840,173

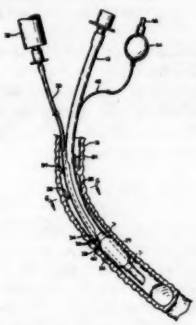
ENDOTRACHEAL TUBE COMBINATION

John W. Porter, III, 6224 NE. Davis St., Portland, Oreg. 97213

Filed Feb. 22, 1988, Ser. No. 158,634

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.15 **3 Claims**



1. An endotracheal tube for ventilating the lungs of a patient comprising; a ventilation tube adapted to extend from a gas source into and through the mouth of the patient, past the epiglottis into the trachea and past the vocal chords to end at a position above the carina, an inflatable cuff surrounding the tube inwardly of the extended end and when in position in the trachea, located between the carina and vocal cords, air injection means connected to the cuff for injecting air into the cuff to expand the cuff against the trachea wall for sealing off passage of air around the cuff, and a suction tube defining a suction passage, said suction tube independent of the ventilation tube at its exterior end and merging with the ventilation tube to form a near-circular configuration having independent dual passages and adaptable for passage through the epiglottis and vocal cords in the trachea, said suction passage being noncommunicative with the ventilation passage, said suction tube terminating at an interior end juxtaposed to the inflated cuff to provide an open passage to the space immediately above the cuff, said suction tube end having multiple openings in communication with fluids that pool around the cuff so as not to be blocked by the cuff, said cuff has a section that is immediately adjacent to the suction tube end that is less flexible than the remainder of the inflatable cuff, said interior end of said suction tube having an end opening positioned

adjacent said cuff and juxtaposed the inflated portion of said cuff whereby suction from the suction passage acting against said cuff section is inhibited from closing the openings thereof, and said suction tube having an opposite exterior end for projection out of the patient's mouth and separated from the ventilation tube, and connection means for connecting the suction tube to a source of negative air pressure.

4,840,174

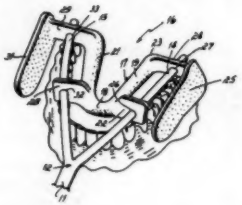
METHOD OF LASER TREATMENT OF CANCERIZATION OF THE ORAL CAVITY

Jack L. Gluckman, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Division of Ser. No. 879,401, Jun. 27, 1986, Pat. No. 4,736,745. This application Dec. 22, 1987, Ser. No. 136,556

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **11 Claims**



1. A method of treating field cancerization of the oral cavity comprising sensitizing premalignant and malignant tissue to a destructive light;

non-selectively irradiating substantially all of the oral cavity with said destructive light by emitting said destructive light through at least one optical diffuser positioned within said oral cavity said destructive light being of an intensity and duration effective to damage said premalignant and malignant tissue.

4,840,175

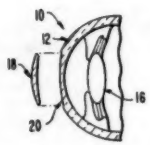
METHOD FOR MODIFYING CORNEAL CURVATURE

Gholam A . Peyman, 535 N. Michigan Ave., Chicago, Ill. 60611

Continuation of Ser. No. 946,633, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 760,080, Jul. 29, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 148,170

Int. Cl.[4] A61N *5/06*

U.S. Cl. 128—303.1 **5 Claims**



1. A method of modifying the curvature of a patient's live cornea comprising the steps of

removing a thin layer from the front of the live cornea and thereby exposing an internal surface thereof,

directing a laser beam onto the exposed internal surface in a predetermined pattern to ablate, and therefrom remove, a three-dimensional portion thereof, and

replacing the originally removed thin corneal layer back onto the ablated internal surface of the live cornea from which the thin corneal layer was removed,

the removing, directing and replacing steps taking place without freezing the internal surface or the thin layer.

4,840,176

TREATING INSTRUMENT FOR USE WITH AN ENDOSCOPE

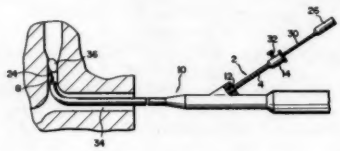
Kunio Ohno, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,448

Claims priority, application Japan, Nov. 6, 1986, 61-264410

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.14 **17 Claims**



1. A treating instrument for use with an endoscope, comprising;

a flexible sheath having a distal end portion and a proximal end portion, said sheath having an opening formed at the distal end portion;

a treating element having a distal end portion and a proximal end portion and accommodated slidably in said sheath, said treating element having directionality and being capable of extending through the opening of said sheath and being used from specific directions to reach the treated part;

an elongated member connected at its one end portion to the proximal end portion of said treating element and inserted slidably in said sheath;

operating means attached to the other end portion of said elongated member, arranged at the rear of the proximal end portion of said sheath and used to move forward and backward and rotate said treating element; and

stopping means for limiting the rotating angle of said treating element when said treating element is rotated by said operating means.

4,840,177

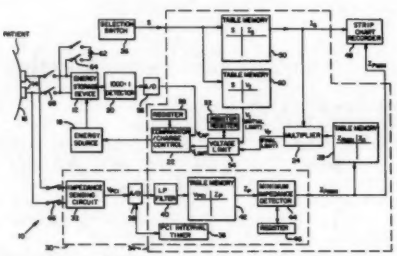
CURRENT-BASED DEFIBRILLATOR

Francis M. Charbonnier, McMinnville; Martin G. Rockwell, Sherwood, and Carl E. Benvegar, Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1987, Ser. No. 117,125

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D **9 Claims**



1. A defibrillator system for delivering an electrical shock to a patient to restore normal cardiac rhythm comprising;

a capacitor for accumulating an electrical charge;

first and second electrodes for applying an electrical shock from the capacitor to the patient;

charging means for charging the capacitor;

detector means for detecting the charge accumulated by the capacitor;

impedance measuring means for determining a transthoracic impedance of the patient, said impedance measuring means including means for sampling the patient's transthoracic impedance periodically;

current establishing means for establishing a fixed magnitude of current which is desired to be delivered to the patient irrespective of the patient's transthoracic impedance; and

circuit means cooperating with the charging means, detector means, impedance measuring means and current establishing means for discontinuing the charging of the capacitor when the accumulated charge is sufficient to deliver the selected current to a patient having the measured transthoracic impedance, said circuit means including processing means for determining the charge accumulation required to deliver the desired current to a patient having a transthoracic impedance equal to the lowest value of transthoracic impedance sampled.

4,840,178

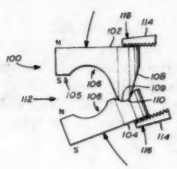
MAGNET FOR INSTALLATION IN THE MIDDLE EAR

Jorgen Heide, Cordoba; Timothy D. Gooch, Memphis; Anthony D. Prescott, Arlington, all of Tenn., and Dennis Bojrab, Bloomfield Hills, Mich., assignors to Richards Metal Company, Memphis, Tenn.

Continuation-in-part of Ser. No. 837,708, Mar. 7, 1986. This application May 15, 1987, Ser. No. 50,940

Int. Cl.[4] H04R *25/00*

U.S. Cl. 128—419 R **7 Claims**



1. A magnet assembly for coupling with the magnetic coil of a hearing said, comprising:

a first separate section sized and shaped to partially surround at least a portion of a bone in the ossicular chain;

a second separate section sized and shaped to cooperate with the first section and clamp onto said portion of a bone in the ossicular chain,

at least one of the first and second sections comprising a magnet and the other section formed of material that is magnetically attracted to the magnet.

4,840,179

COMBINED SENSOR FOR THE TRANSCUTANEOUS MEASUREMENT OF OXYGEN AND CARBON DIOXIDE IN THE BLOOD

Georg J. Ullrich, Freiburg im Breisgau, Fed. Rep. of Germany, assignor to Hellige GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 17, 1987, Ser. No. 121,713

Claims priority, application European Pat. Off., Nov. 17, 1986, 86115941.6

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—633 **5 Claims**

1. A sensor element for simultaneous, continuous, transcutaneous measurement of the partial pressure of carbon dioxide and of the oxygen saturation in the blood of a living body, said sensor element comprising:

a housing having a planar measuring surface;

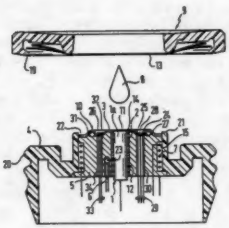
a membrane, permeable to carbon dioxide, sealably disposed about the measuring surface, said membrane having inner and outer surfaces;

a reference electrode and a measuring electrode embedded in the measuring surface and electrically insulated each from the other;

two light emitting diodes embedded in the measuring surface each emitting light of different wave length and so positioned that the emitted light beams do not mutually interfere;

photoelectric receptor means embedded in the measuring surface; and

a thin layer of electrolyte disposed between the measuring surface and the inner surface of the membrane;



whereby when the outer surface of the membrane is brought in contact with the skin, carbon dioxide diffuses through the membrane changing the pH of the electrolyte solution which change in pH is sensed by the reference electrode and the measuring electrode which change in pH is related to the partial pressure of carbon dioxide and whereby the light emitted from the diodes after diffusion through the skin is detected by the photoelectric receptor means and the oxygen saturation of the blood is determined by the principle of pulse oximetry.

4,840,180

ULTRASONIC DIAGNOSIS APPARATUS FOR MEASUREMENT OF SPEED OF MOVING MEDIUM IN A LIVING BODY

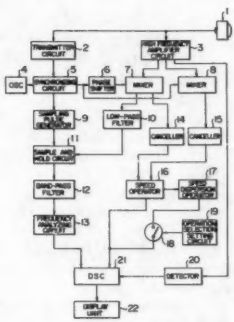
Yukio Ito; Yutaka Sato; Shinji Kishimoto, and Satoshi Tamano, all of Kashiwa, Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Continuation of Ser. No. 804,608, Dec. 4, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 160,754

Claims priority, application Japan, Dec. 4, 1984, 59-255919

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—661.08 **4 Claims**



1. An ultrasonic diagnosis apparatus comprising:

an ultrasonic probe for transmitting an ultrasonic pulse beam toward a moving medium in a living body at a predetermined time interval Δt defining a constant recurrence

frequency and for receiving the reflected wave as a high frequency signal from a portion of the moving medium at any given depth in the living body;

converting means for mixing the received high-frequency signal with a set of complex reference signals having a frequency n times (n: an integer) as high as the recurrence frequency of the transmitted ultrasonic pulse beam and having a complex relation therebetween, thereby converting the received high-frequency signal into complex signals including a sine component signal and a cosine component signal;

operating means including a speed operating circuit for computing a moving speed of the moving medium at said given depth in the living body on the basis of said complex signals, said speed operating circuit including means for obtaining values a and b of said sine component signal at time t and time $(t+\Delta t)$, respectively, and values c and d of said cosine component signal at said times t and $(t+\Delta t)$, respectively, to compute intensities I_t and $I_{(t+\Delta t)}$ of the received signal represented by equations

$$I_t=(a^2+c^2)^{\frac{1}{2}}$$

and

$$I_{(t+\Delta t)}=(b^2+d^2)^{\frac{1}{2}},$$

for using the computed values of intensities I_t and $I_{(t+\Delta t)}$ to compute angular displacements θ and δ, respectively, by equations

$$\theta = \sin^{-1}\frac{a}{(I_t)}$$

and

$$\delta = \sin^{-1}\frac{b}{(I(t+\Delta t))}$$

and for using the computed values of angular displacements θ and δ and the value of said predetermined time interval Δt to compute a Doppler shift frequency f_d represented by

$$f_d=2\pi\lambda(\delta-\theta)/\Delta t,$$

the moving speed of the moving medium at said given depth in the living body being determined from the computed Doppler shift frequency f_d; and

display means for displaying in real time the moving speed computed by said speed operating circuit.

4,840,181

SPHYGMOMANOMETER ADOPTING RECOGNITION OF KOROTKOFF SOUNDS

Keiji Yamaguchi, Shimizu, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Apr. 1, 1987, Ser. No. 32,555
Claims priority, application Japan, Apr. 3, 1986, 61-75452
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—680 **8 Claims**

1. A sphygmomanometer, comprising:

pressurizing means for applying variable pressure to a blood vessel;

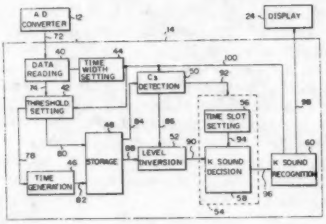
oscillation detecting means for detecting oscillation produced from the blood vessel while pressurized by said pressurizing means;

pressure sensing means for sensing pressure being applied to the blood vessel;

Korotkoff sound recognizing means for recognizing Korotkoff sounds out of the oscillation detected by said oscillation detecting means;

blood pressure computing means for computing blood pressure from the pressure applied to the blood vessel as detected by said pressure detecting means when said Korotkoff sound recognizing means has recognized one of the Korotkoff sounds; and

time width setting means for setting a delay period of time based on the amplitude of a most recent one of the Korotkoff sounds recognized by said Korotkoff sound recognizing means and for inhibiting an output from said oscillation detecting means to said Korotkoff sound recognizing means during the delay period, thereby said Korotkoff sound recognizing means being unable to recognize any of the Korotkoff sounds until the delay period of time set by said time width setting means expires.

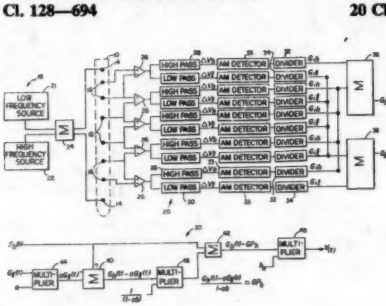


4,840,182

CONDUCTANCE CATHETER

Drew E. Carlson, Providence, R.I., assignor to Rhode Island Hospital, Providence, R.I.

Filed Apr. 4, 1988, Ser. No. 176,924
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—694 **20 Claims**



1. Conductance catheter-apparatus for measuring the volume of a biological chamber having a wall, said apparatus comprising

a catheter employing a plurality of electrodes along its length, said plurality including outer drive electrodes and intermediate potential sensing electrodes between said outer electrodes,

an alternating current source connected to provide alternating currents at high and low frequencies to said outer drive electrodes, and

processing means connected to said intermediate potential sensing electrodes for processing potential signals to obtain a high-frequency conductance signal and a low-frequency conductance signal and for using said conductance signals to determine volume in a manner that excludes parallel conductance through the wall of said chamber and surrounding tissue.

4,840,183
ELECTROCARDIOGRAPH

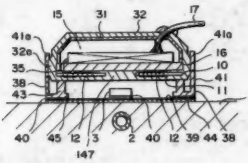
Minoru Takahashi, Funabashi, and Tsutomu Kotani, Kamagaya, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,224

Claims priority, application Japan, Aug. 13, 1987, 62-124044[U]; Aug. 13, 1987, 62-124047[U]; Aug. 13, 1987, 62-124049[U]

Int. Cl.[4] A61B 7/04

U.S. Cl. 128—715 7 Claims



1. An electrocardiograph comprising:

a sensor body having a substrate (16), a plurality of saturable inductors connected alternately in series mounted on one surface of said substrate radially with a predetermined angular period, each of said saturable inductors having a saturable magnetic core and a coil wound on the core, a process circuit means (15) for processing an output of said saturable inductors and mounted on the other surface of said substrate, a lead wire coupled with said process circuit for supplying power to said process circuit and obtaining an output of the process circuit, a shield case (31) surrounding said process circuit, and a housing (32) for securing the above members having a projection (32*b*) on an external wall of the housing,

a magnet assembly having a bottom ring (38*a*) with a plurality of upright wall chips (41) positioned perpendicularly at a periphery of said bottom ring, a film (39) having a permanent magnet (3) at a center of said film attached to said bottom ring, each of said wall chips having an extreme end and jaws at the extreme end so that each said jaw engages detachably with said projection (32*b*) of the housing (32), and a plurality of posts (43) fixed to said bottom ring (38) so that it touches with said sensor body when it is engaged with the magnet assembly, and said magnet is positioned close to said saturable inductors,

wherein the improvements comprise in that at least one of said jaws (141*a*) on the wall chips (41) and said projection (32*b*) on said housing (32) has a slanted surface which engages with said projection (32*b*) or said jaw (141*a*).

4,840,184
SECOND METHOD FOR USING CANNULA INCLUDING A VALVE STRUCTURE AND ASSOCIATED INSTRUMENT ELEMENTS

Rakesh K. Garg, R.R. #1, Box 3032, Lafayette, N.J. 07848

Continuation-in-part of Ser. No. 97,098, Sep. 16, 1987. This application Jul. 6, 1988, Ser. No. 215,830

Int. Cl.[4] A61B 10/00

U.S. Cl. 128—753 1 Claim

1. A method for penetrating external body tissue and for taking a sample of internal body tissue being located below such external body tissue, said method comprising the steps of:

a. penetrating such external body tissue with a cannula-stylet combination, said combination comprising an outer hollow cannula and an inner solid stylet; said cannula including a valve structure, a proximal end portion, and a distal end portion; said cannula distal end portion being longer than said cannula proximal end portion and said valve structure combined; said cannula distal end portion further including a symmetrically tapered circular sharp edge; said stylet including a proximal end portion and a distal end portion; said stylet distal end portion further including a location surface marker and a symmetrically tapered pointed edge; said valve structure being in the open position and said stylet distal end portion being located just distal to said cannula distal end portion;

b. withdrawing said stylet from said cannula while maintaining said cannula distal end portion located within such internal tissue until said stylet distal end portion location surface marker is located just proximal to said cannula proximal end portion whereby said stylet distal end portion is located just proximal to said valve structure;

c. placing said valve structure in the closed position;

d. fully withdrawing said stylet from said cannula;

e. inserting an inner hollow needle-syringe combination into said cannula; said needle including a proximal end portion and a distal end portion; said needle proximal end portion further including a location surface marker; said needle distal end portion further including a location surface marker, sharp lateral edge cutting means, and a circular annular surface; said syringe being attached to said needle proximal end portion; wherein said needle distal end portion location surface marker is located just proximal to said cannula proximal end portion whereby said needle distal end portion is located just proximal to said valve structure and within said cannula proximal end portion;

f. placing said valve structure in the open position;

g. inserting said needle until said proximal end portion location surface marker is located immediately adjacent to the cannula proximal end, whereby said needle distal end portion protrudes beyond said cannula distal end;

h. aspirating any fluid being located just proximal to such internal tissue using said syringe being attached to said needle proximal end portion;

i. obtaining a piece of such internal tissue using said needle distal end portion sharp lateral edge cutting means while further aspirating such fluid using said syringe being attached to said needle proximal end portion;

j. advancing said cannula distally relative to said needle such that said needle distal end portion is covered by said cannula distal end portion;

k. withdrawing said needle from said cannula until said needle proximal end location surface marker is located just proximal to said cannula proximal end portion whereby said needle distal end portion is just proximal to said valve structure;

l. placing said valve structure in the closed position; and

m. fully withdrawing said needle including such piece of attached internal tissue from said cannula having said valve structure in the closed position.

4,840,185
BLOOD SAMPLING DEVICE WITH SHIELD

Manuel Hernandez, 1030 NW., 181 St., Miami, Fla. 33169

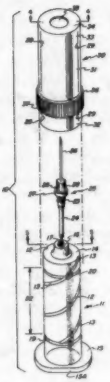
Filed Feb. 17, 1988, Ser. No. 157,274

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—763 12 Claims

1. A medical device comprising barrel means including an elongated cylindrical portion having a first and second end portion at opposite ends thereof; needle assembly means projecting from said second end portion of said elongated cylindrical portion; groove means provided in the outer surface of said elongated cylindrical portion and protective shield means including locking button means operatively connected to said groove means, said groove means including a plurality of rearwardly extending grooves and a plurality of circumferential locking grooves, said locking grooves located adjacent said

first and second end portions of said elongated cylindrical portion, said circumferential locking grooves being intersected by said rearwardly extending grooves with said locking groove being of lesser depth at said point of intersection,



whereby said protective shield means is telescopically positioned over said elongated barrel means and is movable between a first and second position to alternatively prevent accidental contact with said needle assembly or permit use of said medical device for its intended purpose.

4,840,186

IMPLANTABLE MULTI-POLE COAXIAL LEAD

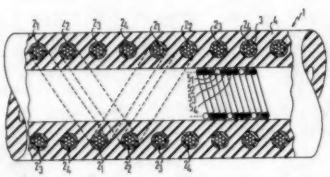
Anders Lekholm, Bromma; Ulf Fahlstroem, Stockholm, both of Sweden, and Hermann Groothoff, Friesoythe/Altenoythe, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,920

Claims priority, application European Pat. Off., Jun. 1, 1987, 87107895.2

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—784 **17 Claims**



1. A multi-pole coaxial lead for an electrode for stimulating body tissue comprising:

a plurality of conductors wound in a helix; first insulating material individually surrounding each conductor in said plurality of conductors;

a tube consisting of a second insulating material said tube having a wall in which said plurality of conductors are embedded and axially separated from each other surrounded by said second insulating material, and said tube having a central opening therein; and

a helically wound stylet guide coil disposed in said central opening of said tube of second insulating material.

4,840,187

SHEATH APPLICATOR

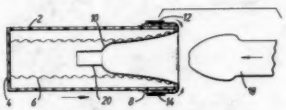
Gary B. Brazier, Harwich, England, assignor to Bard Limited, Sunderland, England

Filed Aug. 28, 1987, Ser. No. 90,375

Claims priority, application United Kingdom, Sep. 11, 1986, 86 21884

Int. Cl.[4] A61F *5/43*

U.S. Cl. 128—844 **18 Claims**



1. A sheath applicator assembly for locating a sheath on a patient's penis, comprising:

a generally tubular applicator casing dimensioned to contain a sheath and having a first open end and a second end;

a generally tubular flexible liner casing located in the applicator casing and having an open end positioned at the first end of said applicator casing, and folded back thereover, said liner casing being fixedly secured to said applicator casing at a region remote from the first end of said applicator casing; and

a sheath located within said liner casing and having an open end at the open end of the liner casing and folded back over the open end of the liner casing and the applicator casing;

the coefficient of friction between the liner casing and the applicator casing being less than the coefficient of friction between the liner casing and the sheath.

4,840,188

DESENSITIZING CONDOM

Herbert J. Heidenfelder, 1270 NE. 95th St., Miami Shores, Fla. 33138

Filed Jan. 11, 1988, Ser. No. 142,647

Int. Cl.[4] A61F *5/44*

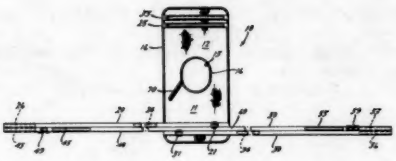
U.S. Cl. 128—844 **1 Claim**

1. A condom for use by a male human during sexual intercourse comprising a phallic-shaped elastic sheath having a closed end and an open end, a local coating on the inside surface of said closed end, said local coating consisting essentially of a topical anesthetic for delaying ejaculation by said male human during said sexual intercourse and a water-soluble base therefor, and a small colored bump on said sheath solely adjacent to said open end, said mark being visually distinct from the color of said sheath and visually indicating said inside surface on which said local coating is located.

4,840,189
RESTRAINING VEST

Roberta S. Wachtel, 10469 Puttygut Rd., Richmond, Mich. 48062

Filed Jan. 29, 1988, Ser. No. 150,151
Int. Cl.[4] A61F 13/00
U.S. Cl. 128—869 10 Claims

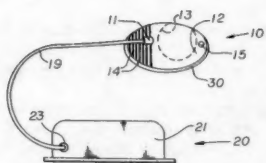


1. A vest for restraining a patient in a supporting structure, said supporting structure having a frame, comprising:
- a main body including a front panel portion, a back panel portion and a centrally located opening for receiving a patient's head and neck;
- a pair of straps extending laterally in opposite directions beyond the lateral side edges of said front panel portion, said pair of straps being of sufficient length to extend around the back of said patient;
- a first means for releasably fastening said pair of straps to said back panel portion;
- a pair of means for guiding each strap of said pair of straps after said first straps are extended around said patient's back and fastened to said back panel portion, said guide means attached to said front panel portion;
- a third strap extending laterally in opposite directions beyond both lateral side edges of said front panel portion, said third strap for routing around said frame of said supporting structure;
- a second means for fastening said pair of straps to said third strap whereby a patient wearing said vest may be restrained in said supporting structure.

4,840,190
LOZENGE-SHAPED LOW PROFILE INJECTION RESERVOIR

Gordon H. Sasaki, Pasadena, Calif., assignor to Dow Corning Wright, Arlington, Tenn.

Continuation of Ser. No. 907,203, Sep. 12, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 183,460
Int. Cl.[4] I61B 19/00
U.S. Cl. 128—897 1 Claim

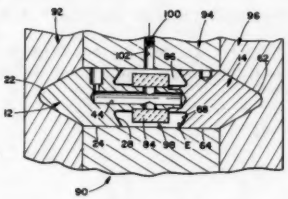


1. An improved injection reservoir for subcutaneously pressurizing an inflatable implantable prosthesis of the type wherein said reservoir comprises a body of a biocompatible, implantable material having a lower base surface which is intended to be placed against bodily structures and a curved upper wall which is sealingly attached to the base surface to form a hollow interior chamber, said upper wall being of a substantially non-expansible elastic material of which at least a portion is self-sealing to penetration by a hypodermic needle to permit the hollow interior chamber to be filled by a hypodermic needle, said hollow interior chamber being sealingly connected to a fluid conduit means to permit fluid injected within said hollow interior chamber to be passed into the interior of said inflatable prosthesis, wherein the improvement comprises the body of the injection reservoir having a front end, a rear end, and two sides when viewed from above said upper wall wherein said front and rear ends are each substantially shaped as an acute angle and said sides are each substantially shaped as an obtuse angle and wherein said lower base surface being generally flat and said upper wall continuously tapers in a relatively flat curve from its highest point to its edge in a smooth fashion which facilitates insertion and removal to and from the desired site in the patient and wherein said fluid conduit means is connected to said hollow interior chamber at said rear end of the injection reservoir and said rear end has an upper surface which includes a plurality of raised ridges thereon wherein each of said ridges extends substantially parallel with the width of said injection reservoir.

4,840,191
INFLATABLE VALVE

Theodore J. Gausman, Mentor, and Gary W. Scheffel, Streetsboro, both of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Apr. 5, 1988, Ser. No. 178,065
Int. Cl.[4] F16K 7/10, 43/00
U.S. Cl. 137—15 17 Claims



12. A method of assembling a valve member comprising the steps of:
- connecting a plurality of valve body members for defining a fluid supply line therein extending between an inlet and outlet;
- placing an annular filter over the outlet, filter receiving at least one of said body members therein and interconnecting said other body member thereto;
- bonding an elastomeric material to the valve body members and encompassing the outlet and filter; and,
- curing said elastomeric material on the valve body members.

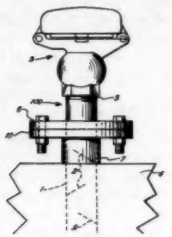
4,840,192
HYDRAULIC HAMMER REDUCTION SYSTEM FOR RAILROAD TANK CARS

Sylvester E. Yandle, II, c/o Industrial Pump Sales, Inc., 2814 Engineers Rd., Belle Chasse, La. 70037

Filed May 5, 1986, Ser. No. 859,791
Int. Cl.[4] F16K 17/40
U.S. Cl. 137—681 12 Claims

7. In a moving tank carrying a liquid load, such as for example a railroad tank car:
- a rupture disk assembly for allowing some of the liquid load to escape from the tank before the tank is fractured from the hydraulic hammer action;
- a mechanical energy dissipation system for dissipating hydraulic hammer action in the moving tank car, comprising
- a mechanical device of a relatively small size in comparison to the size of the tank, said device extending down into the interior of the tank and being located in the line of flow of the liquid between the rupture disk of the rupture disk

assembly and the liquid load in the tank, said device presenting a series of diverging, energy dissipating impact surfaces to the liquid flow from the tank to the rupture



disk, significantly dissipating the hydraulic hammer action of the liquid from the impact of the liquid against the impact surfaces as it flows through said device.

4,840,193

ELECTROMAGNETICALLY ACTUATABLE THREE-WAY/TWO-POSITION DIRECTIONAL CONTROL VALVE

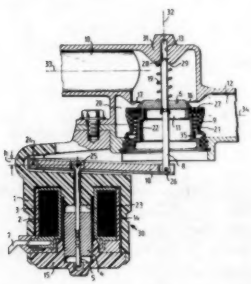
Lothar Schiel, Hofheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 211,634

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722009

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—627.5 **6 Claims**



1. An electromagnetically actuatable three-way/two-position directional control valve for alternatively connecting an outlet port to a first and to a second inlet port, comprising a valve chamber with which the outlet port is in direct communication, the inlet ports respectively communicate with said valve chamber through two sealing seats adapted to be alternatively closed or opened by means of a movable valve closure member, at least one electromagnet comprising a housing accommodating a magnet coil and a slidably disposed armature, said armature operatively connected to said electromagnet and valve closure member by a valve-actuating tappet such that when the electromagnet is excited, said armature actuates the valve closure member, a connection being established between the second inlet port and the outlet port in an inactive position of the valve closure member, wherein the valve closure member includes an elastic valve member having a sealing surface biased by a compression spring in a direction of the first sealing seat in the inactive position, said valve closure member being movable relative to a valve plate which cooperates with said sealing surface of said elastic valve member, said valve plate biased downwardly against said sealing surface by resilient resetting means in the inactive position of the closure member, and during actuation of said electromagnet, an intermediate position of the valve member is provided for in which intermediate position the two sealing seats are simultaneously closed.

4,840,194

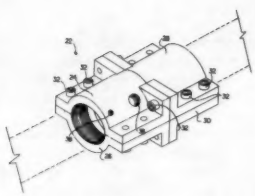
EXPLOSION PROOF ELECTRICAL CONDUIT SEALING FITTING

Richard C. Berry, Camillus, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 14, 1988, Ser. No. 143,871

Int. Cl.[4] F16L *9/22*

U.S. Cl. 138—155 **1 Claim**



1. An explosion-proof electrical conduit sealing fitting for threadedly engaging at least two threaded conduits and surrounding at least one conductor running through said at least two threaded conduits, said fitting comprising:

a first sub-element having a portion threadedly engaging a portion of at least one of said at least two threaded conduits;

a second sub-element having a portion threadedly engaging at least a portion of one of said at least two threaded conduits;

means for connecting said first sub-element to said second sub-element;

a third sub-element having a portion threadingly engaging a portion of at least one of said at least two threaded conduits;

a fourth sub-element having a portion threadingly engaging a portion of at least one of said at least two threaded conduits;

means for connecting said third sub-element to said fourth sub-element;

said first, second, third and fourth sub-elements being substantially identical;

means for connecting said first sub-element to said third sub-element; and

means for connecting said second sub-element to said fourth sub-element;

whereby said connected first, second, third and fourth sub-elements completely surround said at least one conductor and threadedly engage all of said at least two threaded conduits.

4,840,195

PISTON-BACKED GAS PRESSURE REGULATOR

John S. Zabrenski, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 19, 1987, Ser. No. 122,959

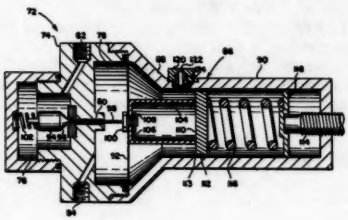
Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—312 **9 Claims**

1. In a gas pressure regulator which includes a housing having a high pressure chamber, a low pressure chamber, an orifice extending between the high pressure chamber and the low pressure chamber, a bonnet mounted across an end of the

low pressure chamber, a valve plug in the high pressure chamber adapted to move toward and away from the orifice to open and close the regulator, and means across the low pressure chamber and connected to said valve plug for moving the valve plug toward and away from the orifice, the improvement comprising:

the means for moving said valve plug includes a flexible diaphragm secured across the low pressure chamber to



separate the low pressure chamber from the bonnet, a rigid piston sealingly mounted across the bonnet spaced from the flexible diaphragm and forming a chamber therebetween, means connecting the rigid piston to said flexible diaphragm so that they move together, and means in the chamber between the diaphragm and piston for indicating any leakage across said flexible diaphragm without allowing the leakage to escape from the chamber to the atmosphere.

4,840,196

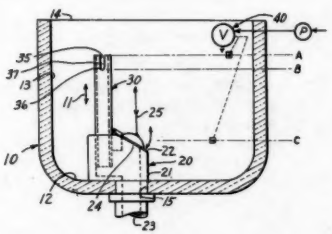
BI-STABLE, THREE CONDITION FLUSH TANK SYSTEM

Bruce A. Antunez, 1143 Indian Springs Dr., Glendora, Calif. 91740

Filed Jun. 10, 1988, Ser. No. 205,267

Int. Cl.[4] F16K *31/18, 33/00*

U.S. Cl. 137—410 **12 Claims**



1. A flush tank system comprising:

a water storage tank having an outlet;

a flush valve in said outlet adapted to close to hold stored water in said tank, and to open to discharge said water through said outlet, said flush valve including a standpipe rising in said tank and discharging into said outlet, said standpipe having a peripheral wall with an upper end establishing an uppermost water level in said tank, and drain means in said peripheral wall at a repose level, said drain means draining water from said tank down to said repose level;

a tank valve mounted to said tank for receiving water to be supplied to said tank, and; having an open condition for supplying water to said tank and a closed condition preventing said supply; said tank valve including water level-responsive control means selected to establish said condition, said control means being bi-stable, and retaining the most recent condition pertaining to either a level higher than said repose level or a lower level respective to drainage of stored water from said tank to a predetermined lower level;

whereby with the flush valve closed and the tank valve open, water is continuously supplied to a preselected level above the repose level, at which event the water level responsive control means changes the tank valve to a closed condition and water drains through said drain means through said standpipe to said discharge outlet of said flush valve until the repose level has been reached, and the system remains in repose with both valves closed, with the tank valve remaining closed and opening only after the water level has lowered to a desired predetermined level, and said flush valve closing at a desired closure level.

4,840,197

POWER STEERING VALVE

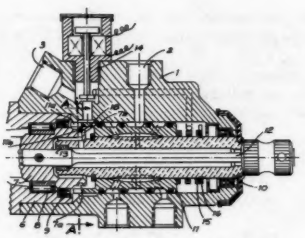
Arthur E. Bishop, and John Baxter, both of P. O. Box 217, Gladesville, 2111, Wales

Filed Jun. 14, 1988, Ser. No. 206,290

Claims priority, application Australia, Jun. 15, 1987, P 12477

Int. Cl.[4] F15B *13/14*

U.S. Cl. 137—625.21 **2 Claims**



1. A rotary hydraulic valve to control the hydraulic pressure in power steering gears for automotive vehicles, comprising:

an input-shaft;

a coaxially arranged driven member;

a torsion bar drivingly connecting said input-shaft and said driven member, interengaging means connecting said input-shaft and said driven member arranged for limited lost motion between said input-shaft and driven member;

an axially movable sleeve surrounding said input-shaft;

an intermediate member carried between said sleeve and said driven member to provide a slack-free driving connection between said sleeve and said driven member;

the said intermediate member being in the form of a thin arcuately shaped member having arms extending partially around and embracing the driven member and outwardly and inwardly extending lugs respectively engaging and fitting closely within slots formed in the sleeve and the driven member, the lug fitting within the slot in the sleeve being constructed and arranged to permit axial movement of the sleeve.

4,840,198

CONTROL VALVE

Helmut Ott, Stuttgart, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Jan. 14, 1988, Ser. No. 143,969

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1987, 3700899

Int. Cl.[4] F16K *11/04*

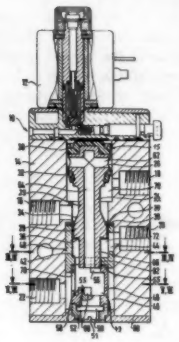
U.S. Cl. 137—625.64 **12 Claims**

1. A directional control valve unit; comprising:

a housing having fluid inlet means, fluid outlet means includ-

ing two working ports, and vent means with one working port directly connectable to said vent means;

valve means including a control valve via which said other working port is connectable with said vent means, said control valve being accommodated in said housing and having one section in form of a seat-type valve in the area



of said one working port and another section in form of a sliding-type valve in the area of said other working port; and

throttle means for controlling ventilation of said fluid outlet means and including a throttle bush rotatably arranged in said housing and cooperating with said valve means.

4,840,199

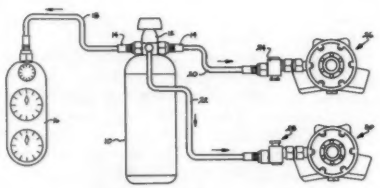
REGULATOR SAFETY VALVE

Charles D. Brunt, Jr., 322 Country Breeze La., Duson, La. 70529-9562

Filed Nov. 3, 1987, Ser. No. 116,250

Int. Cl.[4] A62B 7/00

U.S. Cl. 137—883 **8 Claims**



1. A self-contained underwater scuba apparatus comprising:

an air cylinder for receiving and containing pressurized air;

a first stage regulator mounted to an outlet of said air cylinder and defining a plurality of nozzles;

a first second stage regulator;

a second second stage regulator;

a first control valve mounted intermediate said first stage regulator and said first second stage regulator, said first control valve including a valve housing having a first connector comprising an externally threaded female connector element connectable to a source of breathable gas and a second connector comprising a male connector element having a lock nut element mounted circumferentially thereabout and connected to the first second stage regulator of the underwater breathing apparatus, an intermediate valve stem receiving passage; and an intermediate valve stem mounted within said stem receiving passage so as to be slidable along a longitudinal axis thereof; said valve stem including means defining a flowthrough passage between a bore of said first connector and a bore of said second connector such that the valve stem is slidable from a first position wherein communication between said first and second connector bores is cut off to a second position wherein flow therebetween is possible via said flowthrough passage; and

a second control valve mounted intermediate said first stage regulator and said second second stage regulator.

4,840,200

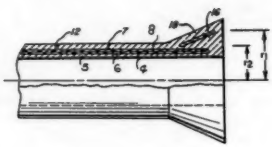
PRESTRESSED TUBE

Richard L. Creedon, San Diego, Calif., assignor to General Atomics, San Diego, Calif.

Division of Ser. No. 818,203, Jan. 13, 1986, Pat. No. 4,774,872, which is a continuation-in-part of Ser. No. 506,430, Jun. 21, 1983, Pat. No. 4,624,173. This application Oct. 19, 1987, Ser. No. 110,211

Int. Cl.[4] F16L 9/04

U.S. Cl. 138—172 **12 Claims**



1. A prestressed tube comprising:

inner and outer concentric, generally cylindrical walls substantially homogeneous so as to be free of internal stress-imparting members and having opposed cylindrical surfaces;

a nonadhering lamina between said inner and said outer walls; and

a pressure medium beween said nonadhering lamina and at least one of said inner and said outer walls, pressing agains the opposed cylindrical surfaces so as to bias said inner and said outer walls away from each other with a prestress force.

4,840,201

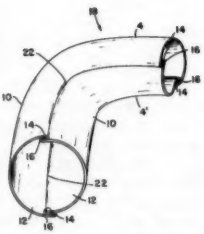
TWO PIECE PIPE FITTING COVER

Chris J. Botsolas, St. Petersburg, Fla., assignor to Carol M. Botsolas, St. Petersburg, Fla.

Filed Apr. 22, 1988, Ser. No. 185,078

Int. Cl.[4] F16L 57/00

U.S. Cl. 138—178 **12 Claims**



1. A cover adapted to be placed about an insulated or uninsulated pipe fitting comprising:

two half sections each comprising a body having an interior surface and an exterior surface and two edges;

a pair of opposed side seams extending along each edge of each said half section, said side seams comprising a groove

and a lip extending from said groove, the groove of one half section being located between the lip and the interior surface of said half section and the groove of the other half section being located along each edge between the lip and the exterior surface, each said lip being substantially parallel to a surface of said body, and wherein said lip of each side seam of one half section is adapted to be transversely insertable into and interlock with the corresponding groove of the other half section, when the half sections are secured about a pipefitting to create a lock seam between said half sections.

4,840,202

ELECTRICALLY CONDUCTIVE TWO COMPONENT TWISTED YARN AND FABRICS FOR TEXTILE FLAT GOODS FOR CLEAN ROOMS AND CLEAN ROOM WEARING APPAREL

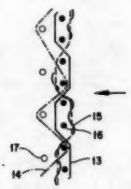
Mattias Feustel, Triebes; Guenter Frotscher, Greiz-Gommla; Wieland Nitschke, Greiz; Dieter Obenauf, Greiz; Juergen Saupe, Dresden, and Manfred Weidelt, Gera-Lusan, all of German Democratic Rep., assignors to VEB Forschung und Entwicklung, Greiz, German Democratic Rep.

Division of Ser. No. 926,596, Nov. 3, 1986. This application Oct. 30, 1987, Ser. No. 115,679

Claims priority, application German Democratic Rep., Nov. 8, 1985, 2826362; Jun. 2, 1986, 2907933; Jun. 9, 1986, 2911013

Int. Cl.[4] D03D *15/02*

U.S. Cl. 139—425 R **2 Claims**



1. Fabric for the production of textile flat goods and wearing apparel for clean rooms comprising electrically conductive combination yarns and electrically nonconductive synthetic yarns, the fabric having an upper ply of electrically nonconductive combination yarns and a lower ply stabilizing the upper ply and interwoven with the electrically nonconductive yarns of the upper ply, wherein the lower ply includes electrically nonconductive lower ply warp yarns interwoven with electrically nonconductive lower ply filling yarns into a 1/1 plain weave, 4 electrically nonconductive lower ply warp yarns within a pattern repeat additionally interwoven with 4 electrically nonconductive filling yarns in the upper ply in a plain weave, and 2 electrically conductive combination warp yarns within a pattern repeat interwoven with all electrically nonconductive filling yarns in the upper ply in a pattern repeat in a 2/2 twill weave opposite 2/2 twill woven upper ply warp yarns.

4,840,203

PROCESS FOR CLAMPING, FASTENING AND PRESENTATION OF WEFT THREADS IN GRIPPER WEAVING LOOMS AND DEVICE USED TO THIS END

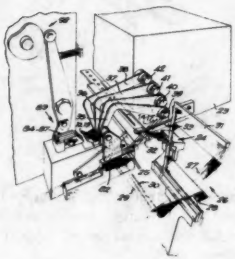
Denis Moeneclaey, Roeselare; Remi Lagache, Zillebeke-Ieper; Johnny Victoor, Langemark, and Lucien Coopman, Zonnebeke, all of Belgium, assignors to Picanol N.V., Ieper, Belgium

Filed Apr. 3, 1987, Ser. No. 33,739

Claims priority, application Netherlands, Apr. 3, 1986, 8600857

Int. Cl.[4] D03D *47/34*

U.S. Cl. 139—453 **9 Claims**



1. Apparatus for clamping, holding and presenting weft threads in gripper weaving looms having at least two weft threads, a gripper for inserting the weft threads into successive sheds and a reed for beating-up the inserted weft thread, comprising:

a) a plurality of movable clamps each clamp holding an end of a weft thread;

b) thread guiding means for deviating the path travelled by the weft threads from a weft thread supply point to a corresponding movable clamp;

c) driving and control mechanism for moving each movable clamp between three positions, wherein: in the first position the weft thread extending between the guiding means and the clamp is out of the path of travel of the gripper; in the second position the weft thread is in the path of travel of the gripper; and, in the third position the clamp is located on the insertion side of the cloth edge in the proximity of and above the fell;

d) auxiliary means attached to the reed for bringing the inserted weft thread back into the respective clamp on the insertion side during the bearing movement of the reed; and

e) cutting-off means for cutting off the inserted weft thread mounted along the insertion side near the cloth edge.

4,840,204

AXIAL COMPONENT LEAD CUTTER AND FORMER

Avraham Shiloh, 127 Thunder Cir., Bensalem, Pa. 19020; Adam Shiloh, 3517 Glen Way, Huntingdon Valley, Pa. 19006, and Peretz J. Shiloh, 534 A Knights Bridge, Bensalem, Pa. 19020

Filed Feb. 25, 1988, Ser. No. 160,145

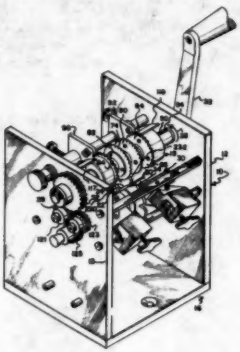
Int. Cl.[4] B21F *45/00*

U.S. Cl. 140—105 **14 Claims**

1. An apparatus for forming leads axially protruding from a component, comprising:

a component carrier having a pair of spaced apart component support walls, at least a pair of opposing generally V-shaped cutouts in said walls adapted to retain said component therein such that said axial leads extend outboard thereof, a lagging outboard edge of each cutout defining a partial conical surface having a conical radius of curvature that is a predetermined function of a coinci-

dental span between opposing cutout defining surfaces; and



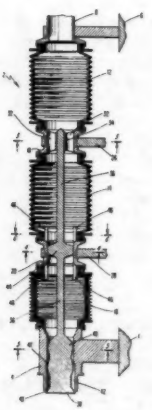
means for bending the axially protruding leads of the component retained in said cutout, said means for bending disposed on either side of said pair of support walls outboard of said component.

4,840,205

METHOD AND APPARATUS FOR DISPENSING LIQUIDS

Gunnar Drevfors, Mendota Heights; Donald G. Cornica, Inver Grove Heights, and Norman J. Paulson, Maple Grove, all of Minn., assignors to Tetra Pak Finance & Trading S.A., Pully, Switzerland

Filed Jul. 8, 1988, Ser. No. 216,335
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—2 14 Claims



1. Apparatus for dispensing liquids comprising

a discharge nozzle having an internal bore, said bore having a central axis,

a movable discharge valve element cooperating with said bore to control liquid flow out of said nozzle,

a valve stem extending from said discharge valve element and along said central axis,

a pair of sleeves arranged coaxial with said valve stem, a first one of said sleeves being spaced from said discharge element a greater distance than the second one of said sleeves,

a first bellows between said nozzle and said second sleeve, and a second bellows between said first sleeve and said second sleeve,

a third bellows connected with said first sleeve and arranged coaxial with said valve stem, liquid supply means for introducing liquid into said third bellows,

said first sleeve being connected with said valve stem for imparting reciprocating motion to said valve stem upon axial movement of said first sleeve,

said valve stem having a control valve element in position to cooperate with said second sleeve to selectively open and close liquid flow between said first and second bellows, and

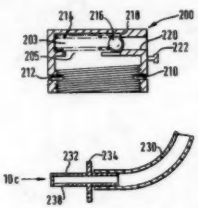
said second sleeve being mounted for axial reciprocating motion relative to said discharge nozzle.

4,840,206

HYDRAULIC FLUID CONTAINERS AND RESERVOIRS

Adrian C. Hill, Winsford, and Derek Jepson, Marton, both of England, assignors to Rolls-Royce Motors Limited, Crewe and Castrol Limited, Swindon, both of, United Kingdom

Continuation of Ser. No. 790,761, Oct. 23, 1985, abandoned, and a continuation of Ser. No. 543,897, Oct. 20, 1983, abandoned.
This application Apr. 8, 1987, Ser. No. 36,207
Claims priority, application United Kingdom, Oct. 22, 1982, 8230159; Dec. 10, 1982, 8235325
Int. Cl.[4] B65B *3/00;* B67C *3/00;* B67D *5/06*
U.S. Cl. 141—349 4 Claims



1. An arrangement of a motor vehicle hydraulic fluid system reservoir and a container for fluid to be transferred to the reservoir comprising:

an opening in the reservoir;

a cap having a substantially restricted orifice removably positioned on said opening;

a discharge opening in the container adapted to mate in substantially fluid-tight male/female relationship with said orifice of said cap when on the reservoir for the transference of fluid from the container into the reservoir, said orifice in said cap having a valve means normally closed but being openable when said opening in said container is mated therewith, said discharge opening in said container mating with said orifice in said cap only when the cross-sectional shapes thereof are the same;

a locking member for interlocking said cap and said discharge opening in said container to one another; and

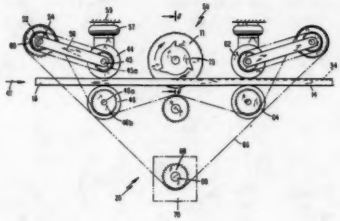
wherein said cap further comprises an opening therein for permitting air to escape from said reservoir while it is being filled via said restricted orifices in said container and reservoir.

4,840,207

APPARATUS FOR MAKING WOODEN I-BEAMS

Jerry L. Lines, Wilmington, N.C., assignor to MiTek Industries, Inc., St. Louis, Mo.

Division of Ser. No. 843,228, Mar. 24, 1986, Pat. No. 4,720,318, which is a continuation-in-part of Ser. No. 764,180, Aug. 9, 1985. This application Jul. 1, 1987, Ser. No. 69,535
Int. Cl.[4] B27C 9/00
U.S. Cl. 144—41 13 Claims



1. Apparatus for manufacturing a pair of elongate wooden chord members each including a longitudinal groove in one surface thereof, from elongate rectangular wooden stock material, comprising:

(a) a splitter blade and a pair of router tips respectively mounted on opposite sides of the blade;

(b) means for rotating said splitter blade and router tips;

(c) means for supporting a length of said stock material during cutting engagement with said splitter blade and router tips; and

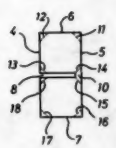
(d) means for providing relative movement between said stock material and splitter blade and router tips substantially along the longitudinal axis of said stock material to split said stock material into substantially identical chord members while forming said longitudinal grooves; said means comprising at least one pair of drive rolls comprising top and bottom rolls extending transversely with respect to the direction of travel of the stock material for driving the stock material between them.

4,840,208

METHOD OF MANUFACTURING OBLONG WOODEN ARTICLES TO BE USED FOR THE MANUFACTURE OF COUPLED-TOGETHER PAIRS OF CHOPSTICKS

Gert Schultz, Hillerod, Denmark, assignor to Stormax International A/S, Herlev, Denmark

Filed Mar. 9, 1988, Ser. No. 166,080
Int. Cl.[4] B27M 1/08; B27L 5/02
U.S. Cl. 144—367 2 Claims



1. A method of manufacturing oblong wooden articles to be used for the manufacture of coherent pairs of chopsticks, comprising the steps of:

punching and cutting the oblong articles out of veneer sheets along outer straight lines resulting in outer surfaces of the oblong articles being formed, said outer surfaces inclining slightly towards one another and extending over the entire length of the articles; and

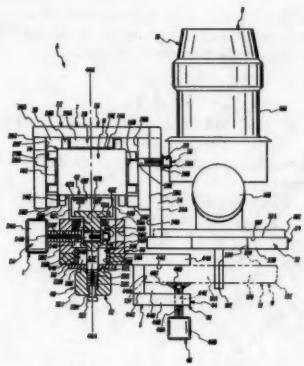
providing each article with a cut along the plane of symmetry between said outer surfaces and leaving a short uncut portion at the thickest end of the article, the cut along the plane of symmetry extending only partially through the article in the transverse direction thereof.

4,840,209

ROUTER GUIDE ASSEMBLY AND METHOD OF USING SAME

Raymond P. Reneau, 5844 Sampley Way, Houston, Tex. 77092

Filed Mar. 10, 1988, Ser. No. 166,260
Int. Cl.[4] B27M 1/00; B27C 5/10
U.S. Cl. 144—371 28 Claims



2. A router guide assembly for guiding a router over a workpiece for making a precise cut on the workpiece, comprising:

an elongate rail member;

a router trolley mounted for movement along the length of said rail member, said router trolley supporting the router for cutting operations on the workpiece, said router trolley including

a trolley member for aligned movement along said rail member;

a router support secured with said trolley member for receiving the router for mounting therewith and,

securing member affixed to said rail member for securing said rail member with the workpiece.

4,840,210

HEAVY DUTY PNEUMATIC RADIAL TIRES

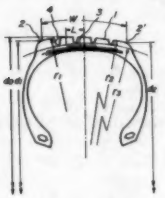
Takashi Kukimoto, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 5, 1987, Ser. No. 81,788
Claims priority, application Japan, Aug. 6, 1986, 61-183454
Int. Cl.[4] B60C 3/06
U.S. Cl. 152—209 A 7 Claims

1. A pneumatic radial tire comprising; a tread with an asymmetrical profile, wherein the tread maximum outer diameter is located spaced from the tire equatorial plane outwardly opposite to a side on which the tire is to be mounted to a vehicle by a distance L equal to a range from 0.05 to 0.30 times as long as the width W of the tread, and a ratio of d_2/d_1 is set at a range from 0.98 to 1.00 in which d_1 and d_2 are diameters of tread shoulders of the tread on a side of the tread maximum outer diameter and on the opposite side of the tread respectively,

wherein when a contour of the tread positioned on opposite sides of the maximum outer diameter circumferential location in a cross section including a rotational axis of the tire is approximated by two arcs, a radius of curvature, r_1

of the tread contour on an outer side of the tire when being mounted onto the vehicle is smaller than a radius of



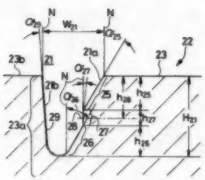
curvature, r_2, of the tread contour on an inner side of the mounted tire, and the maximum outer diameter of the tire is greater than the diameters d_1 and d_2.

4,840,211

PNEUMATIC TIRE HAVING ASYMMETRICAL GROOVE CROSS SECTION

Shigeo Makino, Saitama, Japan, assignor to Bridgestone Corporation, Japan

Filed Jun. 19, 1987, Ser. No. 63,894
Claims priority, application Japan, Jun. 20, 1986, 61-144058
Int. Cl.[4] B60C *11/06*
U.S. Cl. 152—209 R **12 Claims**



1. A pneumatic tire comprising; a tread having at least one circumferential main wide groove, said groove in cross-section having opposite side walls, one of said opposite side walls consisting of a straight outer wall region located at a radially outer portion of said one side wall, a straight inner wall region located at a radially inner portion of said one side wall, a straight intermediate wall region located between said inner and outer wall regions, groove wall angles α_{25}, α_{26} formed between a line perpendicular to an outer surface of said tread and respective straight surface portions of said one side wall in said outer and inner regions selected to be larger than a groove wall angle α_{27} formed between said line and a surface portion of said one side wall in said intermediate region, and the other of said opposite side walls having a substantially linear face along the entire wall.

4,840,212

AUTOMATIC AIR PUMP FOR WHEEL TIRES

Yung-Kuan Wei, No. 1, Lane 970, Sec 2, Pen Tien St., Tainan, Taiwan

Filed Jan. 13, 1987, Ser. No. 2,919
Int. Cl.[4] B60C *23/10, 23/12*
U.S. Cl. 152—419 **5 Claims**

1. Apparatus for automatically maintaining and indicating a desired pressure in a pneumatic tire which is mounted on a wheel of a vehicle, comprising:

a piston;

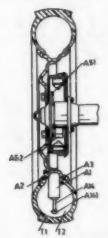
cylinder means adpated to be fixed to the wheel and defining a space in which said piston is mounted to reciprocate;

contact means attached to said piston and adapted to engage an interior portion of the pneumatic tire when the tire is inflated beneath the desired pressure and thereby displace said piston to compress air within said space;

means for biasing said piston relative to said cylinder means so that said contact means is urged toward the interior portion of the tire and said piston is urged toward an end wall of said cylinder;

exhaling valve means for allowing air to pass from said space to the area bounded by the interior of the tire when said piston compresses the air within said space;

inhaling valve means for allowing air to enter from an external atmosphere to said space when said piston depressurizes said space by displacement toward said end wall, whereby an alternate pressurization and depressurization of the space by the piston as the wheel rotates causes air to be supplied to the are bounded by the interior of the tire;



switching means positionally located within said space defined by said cylinder means for opening an electrical path responsive to displacement of said piston from said end wall of said cylinder means; and

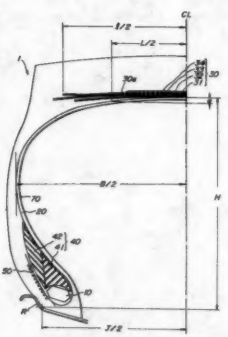
means responsive to said switching means for indicating the displacement of said piston from said end wall and thereby indicate to an operator of said vehicle a tire inflation beneath said desired pressure.

4,840,213

HEAVY DUTY LOW PROFILE PNEUMATIC RADIAL TIRES

Hiroyuki Koseki, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,268
Claims priority, application Japan, Apr. 3, 1987, 62-82463
Int. Cl.[4] B60C *03/04, 09/28*
U.S. Cl. 152—454 **2 Claims**



1. A tubeless type heavy duty low profile pneumatic radial tire comprising a radial carcass layer toroidally extending from one of beads to the other, and a belt comprising at least two

plies successively closely plied on a crown portion of the carcass layer, said at least two plies having non-extensible cords arranged at a shallow angle with respect to an equatorial plane of the tire but intersecting between the plies through the tire equatorial plane, said tire using a 15° rim as a design rum thereof, wherein when the tire is assembled into the design rim and inflated at a normal internal pressure, a shape of the carcass line in a tire radial section meets the following inequalities (1) through (4):

$$0.45 \leqq H/B \leqq 0.75 \quad (1)$$

$$('0.12\ H/B)+0.79 \leqq l/B \leqq (-0.12\ H/B)+0.85 \quad (2)$$

$$(0.1\ H/B)+1.11 \leqq B/J \leqq (0.1\ H/B)+1.15 \quad (3)$$

$$0 < a/H \leqq 0.017 \quad (4)$$

in which H, B, a, J and are the maximum sectional height of the carcass line measured radially from the bead heel, the maximum axial width of the carcass line, a maximum distance between a straight line which is in parallel with a rotary axis o the tire in the radial section and intersects with the carcass line at two points which are separated from each other by a distance: $L=0.96B-0.77H$, width of the tire as measured from one bead heel to the other bead heel and the greatest axial width of a zone where the cords between the belt plies still intersect with one another, respectively.

4,840,214

TIRE BELT REINFORCING STRIP AND METHOD OF MAKING OF SAME

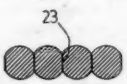
Luc Bourgois, Desselgem, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed Sep. 10, 1987, Ser. No. 95,022

Claims priority, application European Pat. Off., Oct. 10, 1986, 86870146.7; Mar. 9, 1987, 87200427.0

Int. Cl.⁴ D02G *03/48*

U.S. Cl. 152—527 **8 Claims**



1. A tire belt reinforcing strip having a significantly higher bending stiffness in the plane of the strip than in the longitudinal plane perpendicular thereto, wherein said strip is in the form of a bundle of steel wires having flattened sides, extending side by side in one plane when the bundle is in free straight position, adjacent wires being in contact with each other along said flattened sides and bound to each other to such extent that the strip presents, in the plane of the strip, a significant excess of bending stiffness above the sum of the bending stiffnesses of the individual wires in the same plane, the steel cross section being between 0.05 mm^2 and 2 mm^2 with a tensile strength above 2200 N/mm^2 and an elongation at break above 1.5%.

4,840,215

TIRE CHANGER SAFETY POST

Tumkur R. Vijay, and Bryce L. Mannen, both of Conway, Ark., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 10,029, Feb. 2, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 224,204

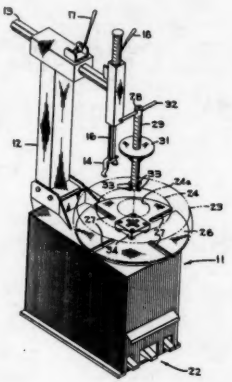
Int. Cl.⁴ B60L *25/00*

U.S. Cl. 157—1.0 **14 Claims**

9. Safety apparatus for a tire changing machine comprising a support table for receiving rim/tire assemblies and a tire inflation system connected to said tire changing machine,

rim restraint means for firmly fixing the rim/tire assembly axially with respect to the support table,

means for releasably connecting said rim restraint means to the support table prior to tire inflation, and



pneumatic valve means attached to said tire inflation system having inflation air enabling and disabling positions, said rim restraint means having means to contact and urge said pneumatic valve means to said enabling position by connecting said rim restraint means to the support table.

4,840,216

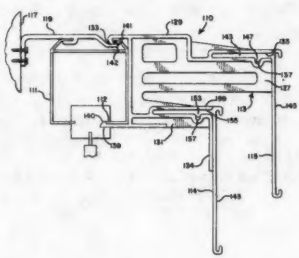
VALANCE BRACKET FOR A VERTICAL BLIND

Julius F. John, Redondo Beach, Calif., assignor to Home Fashions, Inc., Santa Monica, Calif.

Filed May 19, 1988, Ser. No. 196,134

Int. Cl.⁴ E06B *9/38*

U.S. Cl. 160—178.1 **23 Claims**



1. A valance assembly, including a head rail, a support means, a valance mounting means, and a valance;

said support means being mountable to a wall surface;

said head rail being secured to said support means for the support of a blind assembly;

said valance mounting means being mounted to said head rail and having a vertical central web between a lower horizontal arm and an upper horizontal arm, and said upper horizontal arm containing an outwardly opening and inwardly extended longitudinal horizontal recess;

said recess having a horizontal wall and a detent on said wall;

said valance comprising a display face and a support flange mounted thereon for achieving a substantially vertical position of said display face when said support flange is secured in said recess of said valance mounting means; and

said support flange being mounted in said recess and having a detent element engaged with said recess detent, whereby said valance is supported by said valance mounting means on said support means.

4,840,217

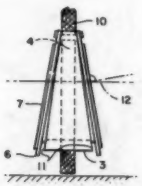
PET PORTAL

Richard Evans, III, Box 23-C Bay Rd., Bowdoinham, Me. 04008

Filed May 9, 1988, Ser. No. 191,432

Int. Cl.[4] E05D *7/00*

U.S. Cl. 160—368.1 **3 Claims**



1. For use with an enclosed structure, a device for providing to selected pet animals easy, independent ingress to and from said structure while deterring passage to non-selected animals, comprising:

a frame which establishes a passageway between the exterior and interior of said enclosed structure,

a plurality of doors depending from said frame and so arranged that all elements of said plurality of doors must be ajar concurrently in order for communication of air between the exterior and interior of said enclosed structure to occur, said plurality of doors comprising only two doors, one located on each of the exterior and the interior sides of said frame, that only open outwardly with respect to said passageway and which only move in opposing directions with respect to one another,

a closing means utilizing gravity and the air pressure gradient along the length of said passageway in order to establish a weathertight seal between said frame and the distal and proximal elements of said plurality of doors, respectively.

4,840,218

AUTOMATIC MATCHPLATE MOLDING SYSTEM

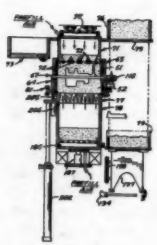
William A. Hunter, Inverness, Ill., assignor to Hunter Automated Machinery Corporation, Schaumburg, Ill.

Filed Apr. 1, 1987, Ser. No. 33,177

The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.

Int. Cl.[4] B22C *15/22, 15/28*

U.S. Cl. 164—169 **8 Claims**



1. A matchplate molding machine comprising a molding flask for making a mold from sand, a sand magazine spaced vertically from said flask, said magazine being movable laterally relative to said flask between a receiving position in which the magazine is spaced laterally from the flask and a delivery position in which the magazine is alined vertically with the flask, said magazine being loaded with sand when in said receiving position and being conditioned to discharge such sand into said flask when in said delivery position, an air plenum spaced vertically from and alined vertically with said flask, said magazine being located between said air plenum and said flask when said magazine is in said delivery position, means for supplying pressurized air to said plenum when said magazine is in said delivery position, vertically opening ports in said plenum for directing pressurized air into said magazine thereby to blow sand from the magazine and into said flask, means mounting said plenum for vertical movement between active and retracted positions, said plenum sealing against said magazine when in said active position thereby to enable the pressurized air to blow the sand from said magazine, said plenum being spaced vertically from said magazine when in said retracted position thereby to enable the magazine to move laterally between said receiving and delivery positions, and means for selectively shifting said plenum vertically between said active and retracted positions.

4,840,219

MIXTURE AND METHOD FOR PREPARING CASTING CORES AND CORES PREPARED THEREBY

Robert W. Foreman, 4353 Covered Bridge Rd., Bloomfield Hills, Mich. 48013

Filed Mar. 28, 1988, Ser. No. 174,394

Int. Cl.[4] B22C *1/18, 9/10*

U.S. Cl. 164—369 **15 Claims**

11. A water disintegratable casting core comprised of:

50–90% of a salt chosen from the group consisting essentially of:

halides, carbonates, sulfates, sulfites, nitrates and nitrites of Group Ia and Group IIa metals, and mixtures thereof; and,

10–50% of a particulate material dispersed in the salt, said particulate material substantially non-reactive with the salt and comprised of a first, material having a mesh size of at least 60–20 and a second material having a mesh size of at least 280.

4,840,220

HEAT PUMP WITH ELECTRICALLY HEATED HEAT ACCUMULATOR

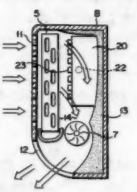
Kenji Umezu, Shizuoka, and Tetsuo Sano, Fujinomiya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 19, 1987, Ser. No. 109,310

Claims priority, application Japan, Oct. 23, 1986, 61-252290

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—1 **11 Claims**



11. A method for controlling an air conditioner, comprising the steps of:

determining an operation start time of the air conditioner;

determining a preheating time for an electric heater for selectively supplying heat to a heat accumulator arranged in an air duct in an indoor unit;

preheating the electric heater a predetermined time before the operation start time;

driving a heat pump type refrigeration cycle constituted by said indoor unit and an outdoor unit when the operation start time for the heating operation is reached; and

controlling a drive state of the heat pump refrigeration cycle for the heating operation on the basis of temperature preset data and indoor temperature detection data.

4,840,221

DEVICE FOR VENTILATING RHEOSTATS AND/OR FLUID RADIATORS IN A LOCOMOTIVE

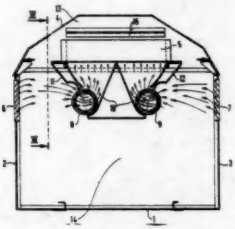
Jean-Claude Dumas, Soisy Sous Montmorency; Maurice Thoraval, Argenteuil, and Gérard Genuit, Bezons, all of France, assignors to Alsthom, Paris Cedex, France

Continuation of Ser. No. 11,815, Feb. 6, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 267,630

Claims priority, application France, Feb. 11, 1986, 86 01847; Jan. 27, 1987, 87 00939

Int. Cl.[4] F28F *13/12*; B61C *5/00*

U.S. Cl. 165—41 **4 Claims**



1. A device for ventilating at least one of a fluid radiator unit and a starting and braking rheostat unit in a locomotive having side walls and a roof, which locomotive is powered electrically, by means of an internal combustion engine or by a combination thereof, said at least one unit requiring ventilation being disposed below and in proximity of the locomotive roof, said device comprising two tangential fans having a horizontal axis of rotation placed longitudinally relative to the locomotive, a triangular shaped volute between said tangential fans and slide baffles above said tangential fans defining separate access chambers from the outlet of said tangential fans to the underside of said one unit, the sum of the cross sections of said access chambers at the underside of said one unit being substantially equal to the area of said at least one unit requiring ventilation, and an air intake opening being placed in each side wall of the locomotive.

4,840,222

HEAT SINK AND MOUNTING ARRANGEMENT THEREFOR

Bryan L. Lakin, and William P. W. McDaniel, both of Springfield, Mo., assignors to Fasco Industries, Inc., Boca Raton, Fla.

Filed Dec. 6, 1985, Ser. No. 805,965

Int. Cl.[4] F28F *7/00*; H02K *11/00, 5/18, 9/00*

U.S. Cl. 165—47 **14 Claims**

1. In a dynamoelectric machine having a generally cylindrical shell surrounding the exterior thereof, and an electronic circuit associated therewith, the improvement comprising a generally arcuate shaped heat sink for mounting at least a portion of the electronic circuit, said heat sink having means to releasably grip the inner surface of the shell to mount the heat sink therein and be in substantially close thermal contact therewith, the releasable gripping means comprising sufficient resiliency and an outer radius of curvature sufficiently different from the curvature of the shell so that when compressed,

inserted therein and released, the heat sink expands against the shell.

4,840,223

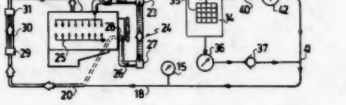
POWER BACK SCRUBBING AND FLUSHING SYSTEM FOR COOLING SYSTEMS

Edward Lee, Winnipeg, Canada, assignor to Solv-X Inventions Ltd., Manitoba, Canada

Filed Oct. 30, 1987, Ser. No. 115,434

Int. Cl.[4] F28G *9/00*

U.S. Cl. 165—95 **14 Claims**



1. Apparatus for flushing and scrubbing the coolant system of an automobile engine which includes a heater core having an inlet and an outlet, an engine block having coolant passages therein and having inlets and outlets therefore, a coolant pump and an engine radiator core all operatively connected together, said apparatus comprising in combination a fluid pump, a liquid holding reservoir connected to said fluid pump, a first conduit extending from said fluid pump and being operatively connected to the outlet of the heater radiator core, a second conduit connected between the outlets of said coolant passages and said reservoir and a third conduit extending between said reservoir and said first conduit, and first valve means in said second conduit controlling the routing of fluid therethrough.

4,840,224

DEVICE FOR TRANSFERRING HEAT ENERGY BY CAPILLARY FORCES

Claudius R. Dietzsch, Stein am Rhein, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Apr. 28, 1988, Ser. No. 187,311

Claims priority, application Switzerland, Apr. 28, 1987, 1631/87

Int. Cl.[4] F28D *15/02*

U.S. Cl. 165—104.26 **10 Claims**

1. A heat energy transfer device for heating or cooling a surface, comprising

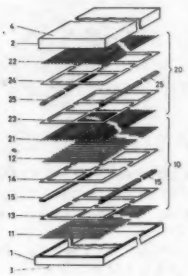
(a) wall means defining a closed cavity; said wall means having an outer face constituting said surface;

(b) a heat transfer medium contained in said cavity and having a liquid phase;

(c) a first capillary means disposed in said cavity for advanc-

ing said heat transfer medium in said liquid phase in a first direction parallel to said surface; said first capillary means including two superposed first arrays of parallel-arranged, spaced wires extending generally two-dimensionally in respective planes oriented parallel to said surface; said first arrays having respective sides oriented towards one another; and first supporting spacer means positioned between said first arrays for maintaining the first arrays in position and for providing a space therebetween; and

(d) a second capillary means disposed in said cavity for



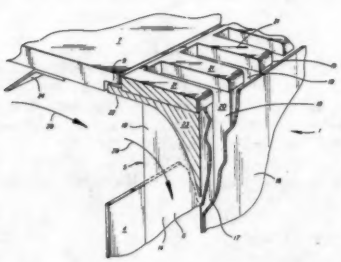
advancing said heat transfer medium in said liquid phase in a second direction parallel to said surface; said first and second directions being non-parallel to one another; said second capillary means including two superposed second arrays of parallel-arranged, spaced wires extending generally two-dimensionally in respective planes oriented parallel to said surface; said second arrays having respective sides oriented towards one another; and second supporting spacer means positioned between said second arrays for maintaining the second arrays in position and for providing a space therebetween.

4,840,225

HEAT EXCHANGE ELEMENT AND ENCLOSURE INCORPORATING SAME

John M. Foley, Grafton; Ronald L. Piuze, Shrewsbury; Ralph I. Larson, Jr., Bolton, and George Doumani, North Andover, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 10, 1987, Ser. No. 37,046
Int. Cl.[4] F28D *15/00*; H01L *23/46*
U.S. Cl. 165—104.33 **12 Claims**



1. An enclosure for heat generating assembly comprising:

a rack in which heat generating assemblies may be mounted, the rack being mounted in a cavity defined by side walls, a rear wall, a front wall, a top and a base which together separate the cavity from the surrounding environment of the enclosure;

at least one of said walls having a heat exchange element sandwiched between an outer panel and an inner panel and being rigidly attached thereto;

said heat exchange element having a heat receiving side facing said cavity and a heat dissipating side facing the surrounding environment and comprising a serpentine metallic member defining a first plurality of parallel vertically extending elongate grooves, having elongate openings all in the heat receiving side, and a second plurality of parallel elongate grooves, having elongate openings all in the dissipating side, the grooves of the first plurality being interdigitated with the grooves of the second plurality, the groove ends all terminating in open ends, and closure means closing all of the open ends of only the first plurality of grooves, said closure means being molded and cured in situ in the groove ends they close;

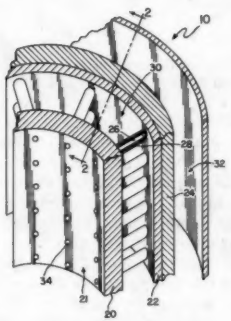
a blower means for circulating air past a said assembly, when in the rack, to cool said assembly and subsequently through the heat receiving grooves of the heat exchange element past the inner panel for recirculation past the assembly.

4,840,226

CORROSIVE RESISTANT HEAT EXCHANGER

Scott L. Richlen, Annandale, Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 10, 1987, Ser. No. 83,340
Int. Cl.[4] F28F *19/00*
U.S. Cl. 165—134.1 **16 Claims**



1. A corrosive resistant heat exchanger for recovering heat from a hot gas comprising:

a first conduit for conveying said hot gas, said first conduit having ducts through the wall thereof, said ducts being spaced at predetermined intervals in the longitudinal and horizontal directions;

a second conduit surrounding said first conduit and having an outer wall spaced outwardly from the wall of said first conduit to form a plenum therebetween, said second conduit having ducts through the wall thereof;

tubes connecting the ducts in said first conduit to the ducts in the wall of said second conduit;

an innocuous gas;

means for conveying said innocuous gas through said ducts in said second conduit wall and into said first conduit, such that a boundary layer of said innocuous gas is formed between the inner surface of said first conduit and said hot gas; and

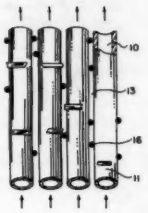
means for pumping a heat recovery medium through said plenum.

4,840,227

PROCESS FOR PRODUCING A HOLLOW FIBER MASS TRANSFER MODULE AND MODULE PRODUCED BY THIS PROCESS

Wolf-Dieter Schmidt, Lübeck, Fed. Rep. of Germany, assignor to Draegerwerk AG, Fed. Rep. of Germany

Division of Ser. No. 112,667, Oct. 22, 1987, Pat. No. 4,769,146.
This application Mar. 14, 1988, Ser. No. 166,876
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636583
Int. Cl.[4] F28D 7/00
U.S. Cl. 165—162 5 Claims



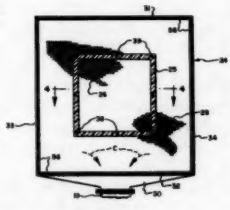
1. A mass heat exchanger comprising a cylindrical housing having an opening at each end, a cap closing each opening having axially aligned tubular connector portions for respective inlet and outlet fluid flow, a plurality of axially extending tubular fibers positioned in said housing and defining a second flow space in their interior volumes, a grout material in said housing adjacent each of the ends of said tubular fibers separating said fibers and securing them in axially aligned positions relative to said housing and defining a first flow space between the grout material of the ends of said fibers, a multiplicity of dispersed separating particles disposed in said first flow space and attached along the lengths of said fibers, providing a separate tubular fiber orientation, and an inlet and outlet connected into a side of said cylindrical housing communicating with said first flow space.

4,840,228

HEAT EXCHANGER HAVING METAL WIRE SCREENS, AND METHOD OF MAKING STACK OF SCREENS THEREFOR

Richard L. Shaner, 10186 Pine Ledge Dr. South, Clarence, N.Y. 14031

Filed Aug. 12, 1985, Ser. No. 764,777
Int. Cl.[4] F28D 7/02
U.S. Cl. 165—165 2 Claims



1. A heat exchanger comprising:
means providing a chamber,
a stack of metal wire screens transversely filling said chamber,
sealant means arranged between adjacent screens in the same endless pattern and located inwardly of the edges of said screens to provide a barrier enclosing an inner region of said stack surrounded by an outer region of said stack,
means clamping said stack of screens to compress said barrier, including bars arranged over said barrier at opposite ends of said stack, tie rods passing through holes in the bars at least at one end of said stack, penetrating the various screens and also said barrier, and at such one end of said stack having threaded ends on which nuts are screwed to bear against such bars,
means for conducting the flow of a first fluid through said inner region from end to end, and
means for conducting the flow of a second fluid through said outer region from end to end,
a layer of gasket material wrapped around said stack to prevent fluid bypassing the screens at the extremities of their said edges,
whereby heat is exchanged between said fluids by way of conduction through the metal wires of said screens.

4,840,229

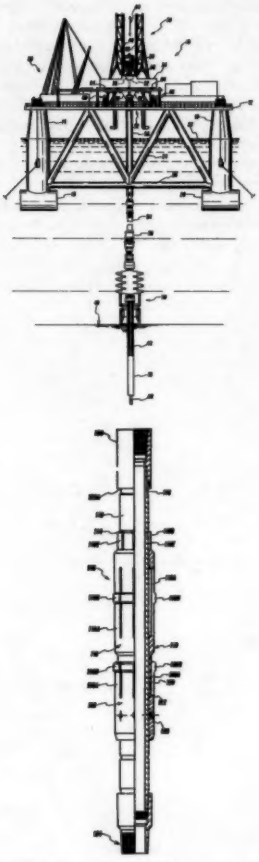
MULTIPLE POSITION SERVICE SEAL UNIT WITH POSITIVE POSITION INDICATING MEANS

Lewis D. Proctor, Kincardineshire, Scotland; Colby M. Ross, Carrollton, Tex.; Brian P. Manzi, Montrose, Scotland, and Frank Giusti, Jr., Lewisville, Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Division of Ser. No. 846,290, Mar. 31, 1986, Pat. No. 4,722,392.
This application Sep. 18, 1987, Ser. No. 98,410
Int. Cl.[4] E21B 23/00
U.S. Cl. 166—381 4 Claims

1. A method for restricting longitudinal movement of a service tool suspended by a work string within a production tubing comprising the steps:
obstructing the annulus between the production tubing and the work string with an annular locator ring mounted on said production tubing string;
longitudinally reciprocating a latch assembly having a fixed collet attached to said work string and a movable collet slidably mounted on said work string;
engaging the annular locator ring with the movable collet and moving said movable collet longitudinally to a separated position on said work string relative to the fixed collet;
lowering said latch assembly below said locator ring;
retracting the work stsring and inserting the movable collet

into a pocket formed between the work string and fixed collet for preveing deflection of said fixed collet; and,



engaging the locator ring with the fixed collet while the movable collet is inserted within said pocket.

4,840,230

RETRIEVABLE WEDGING SYSTEM FOR COUPLING DOWNHOLE DEVICES INTO CASED BORE HOLES

T. Leslie Youd, Orem, Utah, and Garrett O. Jackson, Valencia, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 14, 1987, Ser. No. 96,860

Int. Cl.[4] E21B *23/00, 33/129;* B25B *1/00*

U.S. Cl. 166—382 **16 Claims**

1. A retrievable wedging system for coupling a device to the interior of a cylindrical pipe comprising:

a pair of arcuate top wedges for insertion between the device and the pipe;

a first O-ring for disposition about the top wedges to couple the top wedges to said device;

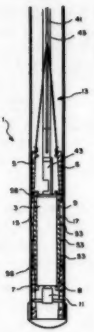
a pair of arcuate bottom wedges for insertion between the device and the pipe, said bottom wedges opposing said top wedges, whereby said top and bottom wedges cooperate to lock the device to said pipe when they are pressed together;

coupling means for slideably coupling the bottom wedges to the device;

retrieving means for disengaging the device from the cylindrical pipe and removing the top and bottom wedges and the device from the pipe, said retrieving means being arranged such that when said device is removed from the pipe, the retrieving means initially disengages said top wedges from said device and moves said device only after said top wedges have been disengaged but before said bottom wedges are moved.

15. A method of releasably coupling a device to a bore hole casing and subsequently retrieving the device comprising the steps of:

coupling a pair of bottom wedges to the bottom of the deice and a pair of top wedges to the top of the device;



inserting the device together with the top and bottom wedges into the bore hole and lowering the device until the bottom wedges contact the bottom of the borehole;

setting the device by pushing the top wedges towards the bottom wedges to lock the device in place against the casing; and

retrieving the device by pulling on a retrieving cable that is connected to both of the top wedges and to the device whereby when tension is applied to the retrieving cable, a first one of the top wedges is disengaged before any tension is applied to move the second top wedge or the device, and then the second top wedge is disengaged before any tension is applied to lift the device itself.

4,840,231

METHOD AND APPARATUS FOR SETTING AN INFLATABLE PACKER

Vel Berzin, and Luis E. Mendez, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 22, 1988, Ser. No. 184,832

Int. Cl.[4] E21B *23/06*

U.S. Cl. 166—387 **15 Claims**

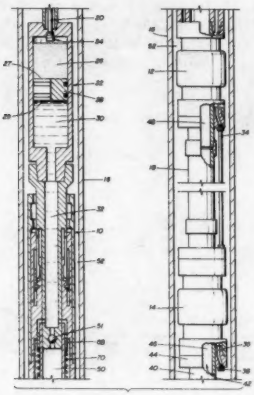
1. Apparatus for setting inflatable elastomeric packer sealing elements selectively positionable in a subterranean well bore by a wireline and radially movable for sealing engagement within the well bore in response to fluid pressure, the apparatus comprising:

pressure generating means suspended in said well bore by said wireline for pressurizing a liquid within a liquid chamber of said generating means;

pressure transmitting means having a fluid passageway in fluid communication with said liquid chamber for transmitting liquid pressure from said liquid chamber to said elastomeric packer sealing elements for moving the element into sealing engagement with said well bore

check valve means for automatically closing said passage-

way in response to a decline in liquid pressure in said passageway; and



pressure relief means in fluid communication with said passageway for relieving liquid pressure to said elastomeric packer sealing elements in excess of a selected level.

4,840,232

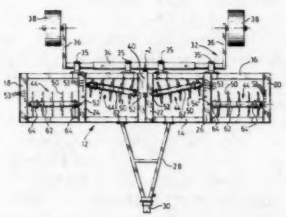
SOIL AERATING EQUIPMENT

Matthew E. Mayer, Woodstock, Canada, assignor to Holland Equipment Limited, Woodstock, Canada

Filed Feb. 23, 1988, Ser. No. 159,158

Int. Cl.[4] A01B *45/02*

U.S. Cl. 172—21 **4 Claims**



1. Soil aerating equipment comprising a frame moveable in an intended direction of travel, at least a pair of shafts freely rotatably mounted on the frame for rotation about the shaft longitudinal axes, said shafts extending in rearwardly inclined opposite directions on opposite sides of a centre line of said frame extending in the direction of travel, means for adjusting the rearward inclination of the shafts to desired angles in the range of from about 90° to about 120° to the direction of travel, each shaft carrying a series of soil-engaging substantially planar tines extending therefrom in vertical planes and positioned to sequentially engage and penetrate the soil with consequent rotation of the shafts when the frame is moved in the direction of travel, each tine having a central longitudinal axis which extends behind the shaft rotational axis at a distance therefrom in the range from about 0.25 to about 1.75 inches and each tine being twisted about the tine central longitudinal axis at an angle to a vertical plane parallel to the direction of travel in the range of from about 1° to about 30°.

4,840,233

AGRICULTURAL IMPLEMENT HAVING ROCK SHAFT ACTUATED TRANSPORT WHEEL FRAMES

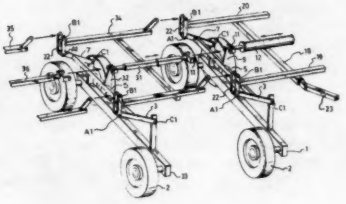
Terrance Friggstad, and David R. Hundeby, both of Saskatoon, Canada, assignors to Flexi-Coil Limited, Saskatoon, Canada

Filed Feb. 12, 1988, Ser. No. 155,516

Claims priority, application Canada, Feb. 3, 1987, 528908

Int. Cl.[4] A01B *63/22, 73/04*

U.S. Cl. 172—311 **22 Claims**



1. A height adjusting mechanism for a framework that supports a multiplicity of ground working tools of an agricultural implement whereby the tools can be variably positioned for variable ground penetration, comprising:

(a) a set of at least four wheels mounted on two horizontally and longitudinally disposed wheel frames, each wheel frame being supported by at least two of said wheels, disposed proximate the respective ends of said frames,

(b) two rigid, longitudinally disposed, rock shafts, each pivotally attached to, at two points proximate the two ends of, a respective one of said wheel frames, said rock shafts being adapted to pivot relative to their respective wheel frames on longitudinal axes passing through the pivotal attachments on their respective wheel frames, at variable elevations above their respective wheel frames,

(c) two longitudinally spaced, transversely disposed, rigid, horizontal, tool mount bars, each pivotally attached, adjacent its two ends, to the two said rock shafts, said tool mount bars being disposed above said rock shafts and adapted to support two ranks of ground working tools,

(d) at least two longitudinally disposed, rigid, frame bars, transversely spaced along said tool mount bars and fastened thereto to maintain the latter in spaced parallel relationship, and

(e) power means to pivot said rock shafts in opposite directions, simultaneously and through equal angles, around their respective pivotal axes.

4,840,234

PNEUMATIC RAM BORING MACHINE

Paul Schmidt, Winterberger Strasse, 5940 Lennestadt 1, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 105,104

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634579

Int. Cl.[4] B25D *17/12*

U.S. Cl. 173—90 **8 Claims**

1. A ram boring machine for use in an underground body of soil and having an external diameter, said machine including an axially reciprocating piston driven by compressed air and imparting impact energy to the boring machine for producing a tunnel in the underground body of soil with the tunnel having

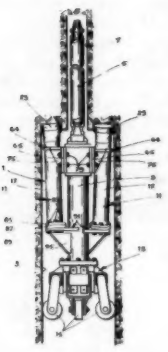
a diameter corresponding to the external diameter of the boring machine and with the boring machine discharging exhaust air in the axial direction into the tunnel wherein the improvement comprises an axially extending hollow cylinder housing having a first end and a second end spaced apart in the axial direction and located in the flow of exhaust air in the tunnel from said boring machine, means forming an axially extending cylindrical passage for conveying compressed air therethrough located within and spaced inwardly from said housing and extending axially between the first and second ends thereof, an annular passageway located between the housing and said means and extending axially between the first and second ends, an end face plate at each of said first and second ends of the annular passageway, exhaust air inlet holes in said end face plate at the first end and exhaust air outlet holes in said end face plate at the second end in general axial alignment for conveying the exhaust air axially through said annular passageway about said cylindrical passage, and at least one of a sound absorbing filter material and an oil separating filter material filling the annular passageway between the first and second ends.

4,840,235

IMPACT HAMMER ASSEMBLY FOR DRILLING ROCK

Roger Masse, 131 Roussin, Thetford Mines, Quebec, Canada G6G 1N6

Filed Apr. 14, 1988, Ser. No. 181,497
Int. Cl.[4] B23B *15/16*
U.S. Cl. 173—104 **11 Claims**



1. An impact hammer assembly for use on a drill head intended for drilling hard material such as rock, said impact hammer assembly comprising:

an elongated case having a longitudinal axis and comprising an inner housing opening at one end of said case;

a drill bit having a forward impact head extending out of said inner housing and a rearward stem extending within said inner housing, said stem being free to rotate and free to slide in said housing about and along said longitudinal axis;

impact motor means mounted in said inner housing, said impact motor means including a linearly reciprocable impact piston mounted behind the drill bit, and means for imparting a reciprocating motion to said impact piston to cause the same to repeatedly hit the stem of the drill bit for said bit head to impact said hard material, and

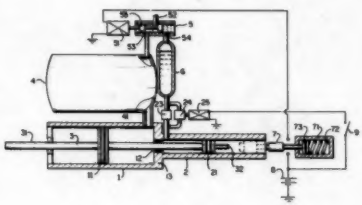
means for retaining the drill bit in said housing, said retaining means including a pair of pins extending transversally across the elongated case, said pins passing through said inner housing on either side of the stem of the drill bit and acting as stop means inside said housing to limit the slidable displacement of said stem without infering with the free rotation of the same.

4,840,236

HYDRAULIC-PNEUMATIC ACTUATOR FOR IMPACT CUTTER

Giora Goldman, 15 Hakibuzim Street, Kiriat Haim, Israel

Filed Apr. 28, 1987, Ser. No. 43,361
Claims priority, application Israel, May 6, 1986, 78698
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—134 **4 Claims**



1. An impact implement for cutting through an object with great force, said implement having a front end and a rear end, and further comprising:

a single-acting impact actuator comprising a large-diameter cylinder (1) positioned at said front end and a large diameter piston (11) contained in said large-diameter cylinder (1);

a single-acting control actuator comprising a small-diameter cylinder (2) positioned at said rear end and a small diameter piston (22) contained in said small-diameter cylinder (2);

said large and small diameter cylinders being coaxially and rigidly connected together and separated by a common partition (13) between said cylinders, and said large and small diameter pistons being connected together by a common piston rod (3) sealingly passing through said partition (13) between said cylinders;

a cutting tool attached to a front end of an extension of said piston rod (3) which is rigidly connected to said piston (11) of said impact actuator and which protrudes out of a front end of said large-diameter impact actuator cylinder;

a large-size air pressure vessel (4) communicating with a rear end of said large-diameter impact actuator cylinder (1) by means of a large-diameter pipe (41);

a liquid-filled pressure vessel (6) communicating with a front end of said small-diameter control actuator cylinder (2) through a check valve (23) and a stop valve (24) in parallel alignment;

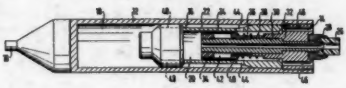
valve means for alternatively connecting said air pressure vessel (4) and said liquid-filled pressure vessel (6) to the atmosphere and to a supply of compressed air;

said control actuator retaining said tool in a retracted position, against the pressure on said large diameter piston (11) of said impact actuator by compressed air contained in said cylinder (1) of said impact actuator and in said air pressure vessel (4), and releasing said large diameter piston (11) and said tool upon opening of said stop valve (24), thereby connecting said control actuator to the atmosphere, whereby compressed air contained in said impact actuator cylinder (1) and in said pressure vessel (4) drives said large diameter piston (11) and said tool forward at substantially constant air pressure.

4,840,237
RAM BORING IMPLEMENT

Helmuth Roemer, Attendorner Strasse 135, D-5950 Finnentrop-Haggen, Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 151,421
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1987, 8700076[U]
Int. Cl.[4] E21B *4/14*
U.S. Cl. 175—19 **12 Claims**

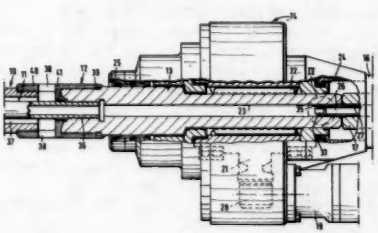


1. A ram boring implement, comprising:
a generally cylindrical housing;
a pneumatically driven percussion piston axially movable in a reciprocating manner in the housing and defining a first pressure chamber in front of it and a second pressure chamber behind it;
a core member mounted axially within said housing;
said core member having an end portion coaxially projecting into the interior of said housing;
a compressed air supply, comprising a compressed air supply hose connected to the housing; and
a control sleeve which is axially adjustable for reversing the direction of motion of the ram boring implement, said control sleeve being arranged on an outer circumferential surface of said end portion and including an annular effective area that is acted upon by the pressure in the second pressure chamber;
said core member including a spindle drive rotatably mounted in said housing for adjusting the axial position of the control sleeve in response to turning of the compressed air supply hose;
said spindle drive having a first end connected to said compressed air hose for rotation therewith and a second end threadedly connected to said control sleeve to adjust the axial position of the control sleeve relative to the spindle drive while the ram boring implement is in operation.

4,840,238
SUPERPOSED DRILLING DEVICE

Günter Klemm, Olpe, Fed. Rep. of Germany, assignor to Ing. Günter Klemm Spezialunternehmen für Bohrtechnik, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,230
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728269
Int. Cl.[4] E21B *4/14*
U.S. Cl. 175—92 **8 Claims**

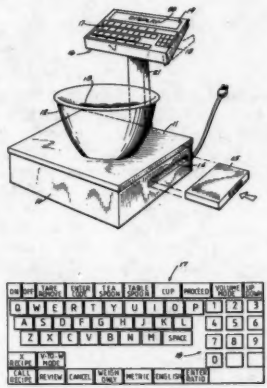


1. Superposed drilling device comprising
a rotary drive (14) rotatingly driving a shank (13),
a hammer drill (15) provided downstream of the rotary drive (14) and whose piston (17) strikes on the shank (13),
a scavenging pipe (26) extending through a bore (27) of the piston (17) and projecting into a scavenging bore (23) of the shank (13),
a seal (34) being disposed between a wall of said bore (23) and the scavenging pipe (26),
characterized in that between said scavenging pipe (26) and said scavenging bore (23), there is an annular chamber (32), and that the scavenging pipe (26) comprises a radially projecting thicker head (33) than said scavenging pipe (26) in which the seal (34) is accommodated.

4,840,239
VOLUMETRIC-TO-GRAVIMETRIC-TO-VOLUMETRIC CONVERTER SCALE

James E. Slagg, 510 Sycamore Ave., South Milwaukee, Wis. 53172

Filed Nov. 22, 1988, Ser. No. 274,857
Int. Cl.[4] G01G *19/40, 19/22*
U.S. Cl. 177—25.14 **25 Claims**



1. A converter scale comprising:
transducer means for producing an electric signal (W) corresponding to the weight of a material placed on the scale,
means for converting said signal (W) corresponding to weight to a signal (V) corresponding to the volume of said material, and
display means responding to said signal (V) corresponding to volume by displaying information indicative of said volume.

4,840,240
WEIGHING AND PACKING DEVICE

Yoshiharu Toyoda, Akashi; Yoshitaka Mikata, Himeji, and Shoji Yamano, Akashi, all of Japan, assignors to Yamato Scale Company, Limited, Japan

Filed Jan. 25, 1988, Ser. No. 147,785
Claims priority, application Japan, Jan. 26, 1987, 62-17096
Int. Cl.[4] G01G *13/00*
U.S. Cl. 177—25.18 **18 Claims**

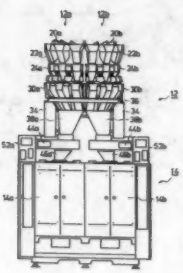
1. A weighing and packing device comprising:
first and second combination weighers, each adapted to deliver batches of product, each batch having a total weight substantially equal to a target weight preset as an operating condition of each said weigher;
first and second packers adapted to pack said batches of product delivered from said first and second combination weighers, respectively;
control means for controlling operation of said first and

second combination weighers and said first and second packers;

at least one operation display means coupled to said control means for supplying operating conditions of said first and second combination weighers and said first and second packers and displaying operation data of said first and second combination weighers and said first and second packers;

said control means adapted to operate said first and second combination weighers in a first mode in which said weighers operate synchronously to deliver said batches of product to their respective packers in first and second cycles, respectively, one cycle being a function of the other, and in a second mode in which said weighers operate nonsynchronously to deliver said batches of product to their respective packers in first and second cycles, respectively, which are independent of each other; and

said control means includes means for selecting one of said first and second modes of operation in accordance with said operating conditions supplied from said operation display means.

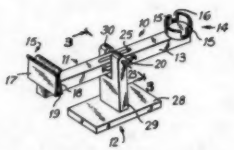


4,840,241

LETTER SCALE WITH COIN COUNTER-BALANCE

Takeshi Ishikawa, 420 E. 80th St., Suite 8L, New York, N.Y. 10021

Filed Oct. 3, 1988, Ser. No. 252,635
Int. Cl.[4] G01G *23/14, 1/18*
U.S. Cl. 177—172 **9 Claims**



1. A coin scale for measuring weight of a mailing material, comprising:

a scale section including an elongated arm, a coin receiving member formed at one end of the arm for supporting a plurality of coins thereon, a mail receiving member formed at the other end of the arm for supporting a mailing material to be weighed thereon, and a first supporting device formed in the arm between the coin receiving member and the mail receiving member, said first supporting device having a plurality of supporting points, said scale section being supported by one of the supporting points, and

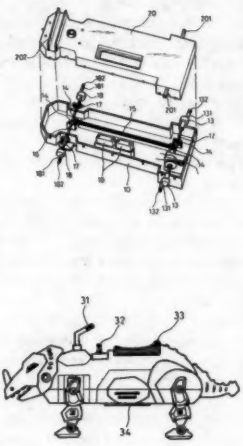
a base section situated under the scale section, said base section having a stand and a second supporting device formed on the stand, said second supporting device rotatably engaging one of the supporting points of the first supporting device and supporting the elongated arm as a fulcrum of a balance so that in at least one supporting point, weight at the mail receiving member which corresponds to the particular weight zone of a mailing material increases step by step as one coin is added in the coin receiving member.

4,840,242

CONVERTIBLE ANIMAL TOY

Liu P. Chih, No. 29, Lane 426, Wor Long Street, Taipei City, and Chi Y. Hwang, No. 21, Lane 20, Chung Chen N. Rd., Sun Chong City, Taipei Shien, both of Taiwan

Filed Mar. 3, 1988, Ser. No. 163,645
Int. Cl.[4] B62D *57/02;* **A63H** *11/20*
U.S. Cl. 180—8.1 **5 Claims**



5. A convertible animal toy, comprising:

a toy body;

a front shaft having opposite ends and a rear shaft having opposite ends, said front and rear shafts being spaced from each other and mounted for rotation to said toy body;

a universal joint connected to each end of said front shaft and on opposite sides of said toy body;

a first pair of eccentric projections connected respectively to said universal joints, said first pair of eccentric projections being in phase opposition to each other;

a second pair of eccentric projections connected respectively to said opposite ends of said rear shaft on opposite sides of said toy body, said second pair of eccentric projections being in phase opposition to each other, eccentric projections from said first and second pair of eccentric projections on each side of said toy body being in phase opposition to each other;

reduction gear drive means mounted to said toy body and operatively connected to said rear shaft for rotating said rear shaft;

a bevel gear connected to each of said front and rear shafts;

a bevel gear shaft having bevel gears engaged with said bevel gears of said front and rear shafts for transferring rotation of said rear shaft to said front shaft over said bevel gear shaft;

a set of moving media for connection to each of said eccentric projections for movement by rotation of said front and rear shafts to move said toy body, said sets including one set of four leg-like pieces each for engagement with one of

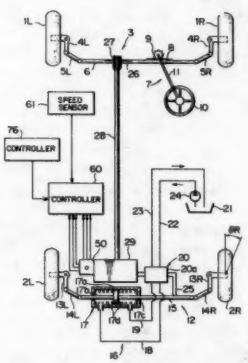
said eccentric projections for executing walking movement with rotation of said eccentric projection, and a second set of four wheels each for connection to one of said eccentric projections for rotation, with rotation of said eccentric rotations; a turning support mounted for pivotal movement to each side of said toy body adjacent said front shaft, each of said first pair of eccentric projections being engaged for rotation in one of said turning supports for steering of said first pair of eccentric projections with pivoting of said turning supports sliding means mounted for sliding movement to said toy body; and connecting means connected between said sliding means and each turning support for pivoting each turning support.

4,840,243

FOUR-WHEEL STEERING VEHICLE

Shigefumi Hirabayashi, Hiroshima, and Toshio Nakajima, Hatsukaichi, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 30, 1988, Ser. No. 238,195
Claims priority, application Japan, Aug. 31, 1987, 62-217296
Int. Cl.[4] B62D *5/04*; B60T *8/00*
U.S. Cl. 180—140 **12 Claims**



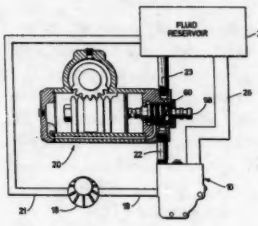
1. A four-wheel steering vehicle including a four-wheel steering mechanism for controlling a steering of front and rear wheels based on a predetermined steering ratio property in accordance with an operation of a steering wheel, and- an anti-lock braking system for controlling a braking force acted on each of the front and rear wheels to prevent the wheels from locking during a braking operation, the improvement comprising steering ratio changing means for controlling a steering ratio of a steering amount of the rear wheels to a steering amount of the front wheels in accordance with a vehicle speed based on said steering ratio property, fail detecting means for detecting an abnormal condition of the anti-lock braking system, compensating means for receiving signals from the fail detecting means and compensating the steering ratio property so that the rear wheels are steered in a direction and amount to improve a driving stability of the vehicle during a braking operation.

4,840,244

AUTOMATIC REGULATOR VALVE ASSEMBLY FOR VEHICLE POWER STEERING

Robert H. Brocksou, Hanover, Pa., assignor to R.H. Sheppard Co., Hanover, Pa.

Filed Dec. 28, 1987, Ser. No. 138,046
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—143 **23 Claims**



3. A vehicle power steering system providing variable power assist characteristics comprising:

steering gear means;

hydraulic pump means to provide pressurized hydraulic fluid to said steering means;

a fluid reservoir to receive low pressure fluid from said steering gear means;

a regulator valve assembly to divide the flow of hydraulic fluid between said steering gear means and said fluid reservoir, said regulator valve assembly including means for varying the flow of hydraulic flow to said steering gear substantially in response to inlet fluid pressure of said steering gear means; and

means for bypassing fluid from said flow varying means around said steering gear; said flow varying means including a flow control valve;

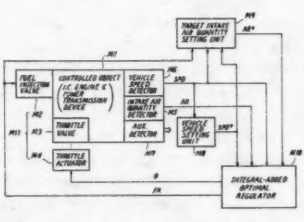
said flow control valve including a reciprocating piston having first and second ends received within a cylinder, the first end of said piston being in fluid communication with said inlet fluid pressure, at least one flow orifice extending transversely across said cylinder, said piston being operative to open and close said orifice to regulate the flow to said steering gear.

4,840,245

APPARATUS FOR CONTROLLING VEHICLE SPEED

Eiichi Kamei, Nagoya, and Hideaki Namba, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 830,139, Feb. 18, 1989, abandoned.
This application Apr. 13, 1988, Ser. No. 183,378
Claims priority, application Japan, Feb. 18, 1985, 60-31906
Int. Cl.[4] B60K *31/04*
U.S. Cl. 180—179 **3 Claims**



1. Apparatus for controlling a speed of a vehicle having an

internal combustion engine and a power transmission mechanism as a controlled object, comprising:

(a) intake air flow rate detecting means for producing an intake air flow signal indicative of intake air flow to said internal combustion engine;

(b) vehicle speed detecting means for producing a vehicle speed signal indicative of a travelling speed of said vehicle;

(c) cruising speed setting means for setting a constant cruising speed in accordance with said vehicle speed signal when a cruising mode is designated;

(d) target intake air flow setting means for setting said intake air flow to a value corresponding to a minimum fuel amount capable of maintaining said cruising speed on the basis of a pattern of correlation between fuel amount and intake air flow, predetermined in correspondence with said cruising speed; and

(e) an integral-added optimal regulator for determining, in receipt of said target intake air flow, said cruising speed, and control input and output values of said controlled object, feedback amounts of controlled variables of said air-fuel mixture supply means on the basis of operating equations used for estimating internal state of said controlled object predetermined in accordance with a dynamic model of the system relating to said controlled object, and also on the basis of an optimal feedback gain, said integral-added optimal regulator then outputting one or more control signals based on said determined feedback amount, said integral-added optimal regulator having:

(i) a first integrator for integrating a difference between said vehicle speed obtained by said vehicle speed detecting means and a target vehicle speed;

(ii) a second integrator for integrating the difference between said intake air flow obtained by said intake air flow rate detecting means and the target intake air flow set by said target intake air flow setting means;

(iii) an observer for estimating an internal state of said internal combustion engine determined on the basis of dynamic models of said internal combustion engine, using information related to throttle valve opening degree, said fuel amount, said vehicle speed and said intake air flow; and

(iv) feedback amount determining means for determining the rate of air flow and fuel amount fed to said internal combustion engine by computing one of matrix products or vector products of the difference outputs from said first and second integrators, said internal state estimated by said observer, and a predetermined feedback gain, said rate of air flow and fuel amount determined by said feedback amount determining means being fed to said observer;

(f) air-fuel mixture supply means for supplying air and fuel to said engine in accordance with said rate of air flow and said fuel amount determined by said feedback amount determining means so as to control the speed of said engine, said air-fuel mixture supply means having at least one fuel injection valve and an actuator for adjusting the opening degree of a throttle valve disposed in an intake pipe of said engine so that said rate of air flow and fuel amount are used to control said fuel injection valve and said actuator, respectively.

4,840,246

POWER TRANSMISSION CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

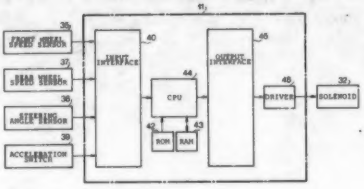
Toru Yamakawa; Fujio Makita, both of Hachioji; Mitsuo Umezawa, and Ryuzo Sakikiyama, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,546

Claims priority, application Japan, Sep. 19, 1983, 58-172665

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—247 **9 Claims**



1. In a power transmission control system for a four-wheel drive vehicle powered by an engine having a transmission for transmitting power of said engine to main driving wheels of said four-wheel drive vehicle, a clutch for further transmitting said power simultaneously to auxiliary driving wheels of the vehicle, and circuit means for engaging said clutch in accordance with driving conditions, the improvement wherein the circuit means comprises:

first sensors for detecting speeds of shafts for said main and auxiliary driving wheels for producing respective shaft speed signals;

a second sensor for detecting steering angle for producing a steering angle signal;

first means for producing a vehicle speed signal when the speed of the vehicle is below a predetermined speed;

comparing means responsive to the steering angle signal for producing a steering angle decision signal when the steering angle is larger than a predetermined value;

second means responsive to the shaft speed signals for producing a speed difference signal when the difference between the speeds of the shafts for the main and auxiliary wheels is smaller than a predetermined value;

decision means responsive to the vehicle speed signal, steering angle decision signal, and speed difference signal for disengaging the clutch for providing two-wheel driving.

4,840,247

DEVICE FOR CONTROLLING 4WD VEHICLE CENTRAL DIFFERENTIAL RESTRICTION DEVICE ACCORDING TO FRONT AND REAR WHEELS ROTATIONAL SPEED DIFFERENCE, AND METHOD OF OPERATION THEREOF

Yuji Kashihara; Yutaka Tage; Yasunari Nakamura; Hiroshi Ito, and Tokuyuki Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 30, 1987, Ser. No. 44,309

Claims priority, application Japan, May 6, 1986, 61-105473; May 6, 1986, 61-105475; Jun. 9, 1986, 61-133065; Jun. 30, 1986, 61-153172; Sep. 29, 1986, 61-230543

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—249 **12 Claims**

1. In a four wheel drive vehicle with an engine, a front wheel propeller shaft, a rear wheel propeller shaft, a central differential device for differentially transsmitting rotational power from said engine to said front wheel propeller shaft and said rear wheel propeller shaft, a front wheels rotational speed sensor for detecting a rotational speed of a combination of front wheels of the vehicle, a rear wheels rotational speed sensor for detecting a rotational speed of a combination of rear

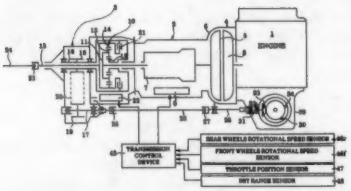
wheels of the vehicle, and a central differential operation resticting device for selectively restricting the differential operation of said central differential device at variable degrees:

a method for controlling said central differential operation restricting device, comprising the steps of:

(a) detecting the rotational speed of the front wheels and the rotational speed of the rear wheels of the vehicle by said front wheels rotational speed sensor and said rear wheels rotational speed sensor, respectively, to produce a first variable value and a second variable value corresponding to the rotational speed of said front wheels and said rear wheels respectively;

(b) comparing said first variable value with said second variable value to produce a third variable value which is the absolute value of the difference between said first and second variable values;

(c) comparing said third variable value with a reference value to detect a first condition that said third variable value is larger than said reference value and a second condition that said third variable is smaller than said refrence value;



(d) increasing the degree of the differential operation restricting operation of said central differential operation restricting device for an increment thereof when said first condition is detected; and

(e) decreasing the degree of the differential operation restricting operation of said central differential operation restricting device when said second condition is detected;

(f) comparing said first variable value with said second variable value to detect a first sub-condition that said first variable value is larger than said second variable value and a second sub-condition that said first variable value is not larger than said second variable value, wherein said reference value is modified according to said second variable value when said first sub-condition is being detected, while said reference value is modified according to said first variable value when said second sub-condition is being detected;

wherein said steps (a), (b), (c) and (d) are repetitively performed in said sequence as long as said first conditon is being detected and said steps (a), (b), (c) and (e) are performed when said second condition is detected.

4,840,248

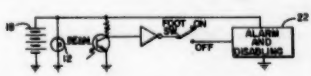
SAFETY SWITCH LIGHT FENCE

Edward J. Silverman, 301 S. Seventh Ave., Suite 325, West Reading, Pa. 19611

Filed Jun. 2, 1987, Ser. No. 57,095

Int. Cl.[4] B60K *28/04*

U.S. Cl. 180—272 **20 Claims**



1. In a vehicle having multiple exit openings about an operator station from which an operator controllably operates various functions of the vehicle, the improvement comprising:

a photoelectric cell system disposed substantially across said multiple exit openings about the operator station, including at least one light source and a plurality of light sensors spaced from the light source, the light sensors producing respective signals responsive to obstruction of a respective beam adjacent the corresponding exit opening from the source to the respective sensor, and means responsive to the respective signal for operating at least one of an indicator and a device for disabling of the vehicles.

4,840,249

APPARATUS FOR SREWING A COVER ONTO A SCREW NECK OF A HEARING AID

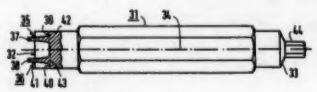
Ulrich Birkholz, Bayreuth; Christof Haertl, Neunkirchen, and Peter Nassler, Eckental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 45,448

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616637

Int. Cl.[4] H04R *25/02*

U.S. Cl. 181—129 **8 Claims**



1. An apparatus for screwing a cover having a central axis onto a screw neck of a hearing aid, comprising a manually graspable rotary shaft having a first end which has at least two pins lying essentially diametrically opposite one another relative to a longitudinal axis of said rotary shaft, said pins mating with corresponding holes arranged in the cover lying essentially diametrically opposite one another with reference to the center axis of the cover.

4,840,250

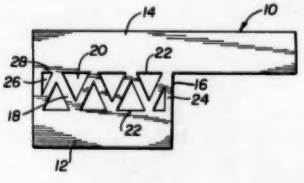
ACOUSTIC IMPEDANCE INDUCING DEVICE

Donald A. Novy, 1234 S. Quince Way, Denver, Colo. 80231

Filed Aug. 25, 1988, Ser. No. 236,669

Int. Cl.[4] G10D *9/00*; G10K *11/00*

U.S. Cl. 181—175 **21 Claims**



1. An acoustical impedance inducing device for axial insertion into a longitudinal air column of a wind musical instrument, comprising:

a first annular band of first predetermined thickness;

a second annular band of second predetermined thickness, wherein said second predetermined thickness is approximately twice said first predetermined thickness; and

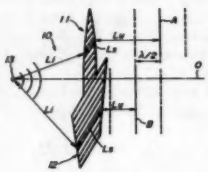
a first web interconnecting said first and second bands and maintaining said bands at a predetermined axial spacing, wherein said web is formed of strips diagonally disposed between the first and second bands and defining a triangle

shaped aperture between adjacent bands, with a base of the triangle being colinear with an edge of one of said first and second bands.

4,840,251
NOISE REDUCING APPARATUS

Masanori Murase, Kodaira; Naotaka Tomita, Sayama, and Kazuyoshi Iida, Yokohama, all of Japan, assignors to Bridgestone Corporation, Japan

Filed Sep. 30, 1988, Ser. No. 251,290
Claims priority, application Japan, Sep. 30, 1987, 62-247349
Int. Cl.[4] F01N *1/06*
U.S. Cl. 181—206 **3 Claims**

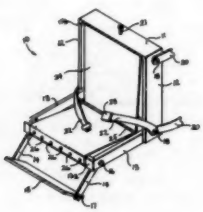


1. A noise reducing apparatus in a form of a hollow body comprising a first group of passages and a second group of passages, a length of each passage of the first group is determined as a sum of; a distance from a sound source to an inlet of a passage, the length of the passage and a distance from an outlet of the passage to an imaginary flat plane in front of the outlet of the passage to achieve a first constant length so that a resultant wave emitted from the outlet after passing through each passage of the first group of the passages becomes a plane wave, and a length of each passage of the second group is determined such that a second constant length is equal to said first constant length plus or minus a half wavelength of a frequency of a sound to be reduced so that the resultant plane wave emitted from the outlet of the passages of the first group and a resultant plane wave emitted from an outlet of the passages of the second group become a plane wave which is shifted from said imaginary flat plane by a half wavelength.

4,840,252
DEER STAND

Lacy K. Hucks, Jr., 229 S. Waccamaw Dr., Garden City, S.C. 29576

Filed Dec. 28, 1987, Ser. No. 138,806
Int. Cl.[4] E04G *3/00*
U.S. Cl. 182—187 **4 Claims**



1. A deer stand apparatus for selective securement to trees and the like comprising:

a housing framework including a top frame member, a bottom frame member, and a plurality of side frame members, and

a seat framework including a plurality of arms pivotally secured to each of said side frame members with a forward seat link and a rearward seat link joining said arms together, and

a foot rest means pivotally secured to said plurality of arms, said seat framework means and said foot rest means foldable within the housing framework at a first position and unfoldably disposable orthogonally to said housing framework in a second position, and

wherein said seat framework means includes a seat fabric wherein said seat fabric is secured to a forward face of said top frame member at one terminal end and securable to said forward seat link at said other end, and

wherein said seat fabric is releasably securable to said forward seat link by means of hook and loop fastening strips and additionally the use of snap fasteners, and

wherein said other end of said fabric is securable to a rear face of said top frame member when said seat framework means and said foot rest means are foldably nested within the housing framework, and

wherein a plurality of tree straps are secured to said side frame members for securement about an associated tree, and

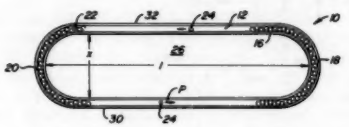
wherein a seat belt is secured to said side frame members, and

wherein at least one of said tree straps and said seat belts are secured to said side frame member about a common connection additionally securing said arms to said side frame members.

4,840,253
METHOD AND APPARATUS FOR SERVING AND DISPLAYING FOOD

Joseph T. DiMaggio, and Marina A. DeMaggio, both of 479 Valencia Dr., South San Francisco, Calif. 94080

Filed Nov. 18, 1986, Ser. No. 932,452
Int. Cl.[4] B65G *53/02*
U.S. Cl. 186—49 **2 Claims**



2. A method for serving and displaying food comprising:

providing a continuous watercourse pathway having a predetermined width and defined by an inner continuous, stationary vertical wall and an outer continuous, stationary vertical wall, said inner and outer vertical walls being spaced apart and substantially parallel to one another in an oblong configuration and with two rounded ends, said watercourse pathway confining water at a continuous horizontal level;

providing a plurality of food carriers floatable in water, each carrier having a circular outer periphery and an outer diameter which is less than the width of said pathway and greater than one-half the width of said pathway;

disposing said carriers sequentially within said pathway and adjacent to one another in a substantially staggered arrangement such that the outer peripheries of substantially every other carrier in said arrangement is in close proximity to said outer vertical wall and the outer peripheries of substantially all of the other of said carriers are in close proximity to said inner vertical wall, and such that the total accumulated spacing between said carriers around said watercourse pathway is less than the smallest carrier diameter; and

circulating water around said watercourse pathway for horizontally propelling said carriers along said pathway in a predetermined direction such that said carriers are in contact only with one another and with said inner and

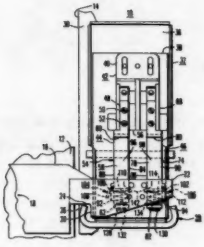
outer vertical walls, wherein during propelling of said carriers by circulating water substantially every carrier physically contacts its adjacent carriers at their respective outer peripheries and contacts one of said vertical walls whereby substantially all of said carriers rotate simultaneously about their respective vertical axes with adjacent carriers rotating in opposite directions.

4,840,254

ELEVATOR HOISTWAY DOOR INTERLOCK

David B. Pearson, Raritan, and Robert A. Wissell, Maywood, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 12, 1988, Ser. No. 231,407
Int. Cl.[4] B66B 13/00
U.S. Cl. 187—57 **5 Claims**



1. In an electro-mechanical elevator hoistway door interlock which mechanically latches an elevator hoistway door in a closed position and provides an electrical indication when the mechanical latch is made, including a first latch portion carried by a hoistway door, a bridging contact carried by the first latch portion, a second latch portion fixed to a hoistway door jamb which is cooperable with the first latch portion to prevent unauthorized opening of the hoistway door when it is closed, and an electrical switch associated with the second latch portion which is actuated by the bridging contact to provide the electrical indication when the hoistway door is closed and latched by the first and second latch portions, an improvement to the electrical switch comprising:

an insulative mounting block,

first and second elongated stationary electrical contacts,

each of said first and second stationary electrical contacts having an upper portion fixed to said insulative mounting block and a lower portion depending from said insulative mounting block,

the lower portion of each of said first and second electrical contacts having a substantially U-shaped configuration in side elevation, including a bight and upper and lower legs,

the bights of said first and second electrical contacts having inner edges in adjacent spaced relation, and outer non-adjacent edges,

the upper leg of each of said first and second electrical contacts being integrally joined to the upper portion of the associated stationary electrical contact,

the lower leg of each of said first and second electrical contacts having an upwardly facing spring seat,

the bights of said first and second electrical contacts each having an outwardly extending arm on said outer non-adjacent edges,

the arm of each of said first and second electrical contacts defining a slot,

a pivotable contact disposed in the slot of each of said first and second electrical contacts, with said pivotable contact having a downwardly facing spring seat,

and a spring disposed to extend between the spring seats of the lower leg and pivotable contact of each of said first and second electrical contacts,

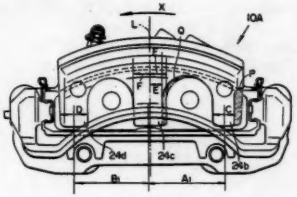
said springs biasing said pivotable contacts to first positions, the pivotable contacts of said first and second electrical contacts being simultaneously pivotable in opposite rotational directions to second positions, against the bias of said springs, by a downward movement of the bridging contact, providing a wiping action between the pivotable contacts and the bridging contact.

4,840,255

DISC BRAKE

Hideto Murakami, Hatano, and Terukiyo Kitamura, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Continuation of Ser. No. 833,141, Feb. 26, 1986, abandoned. This application May 18, 1987, Ser. No. 51,187
Claims priority, application Japan, Feb. 28, 1985, 60-28599[U]
Int. Cl.[4] F16D 65/20
U.S. Cl. 188—73.35 **10 Claims**



1. A disc brake for reducing brake noise in an automobile, comprising:

(a) a disc rotor having first and second major surfaces and being adapted for attachment to a wheel of the automobile;

(b) a carrier for connecting to a fixed member of the automobile, said carrier including:

(i) two spaced arm portions each straddling a peripheral portion of said disc rotor, each of said arm portions including:

(1) a first and second end portion, and

(2) an inner side;

(ii) a base portion positioned at one side of said disc rotor and being connected to said first end portions of each of said arm portions; and .

(iii) a bridge portion positioned at the other side of said disc rotor and being connected to said second end portions of each of said arm portions;

(c) a caliper slidably mounted to said carrier so that said caliper is slidable in a direction perpendicular to the major surfaces of said disc rotor, said caliper including a bridge portion straddling the periphery of the disc rotor, a base portion positioned at a first side of said disc rotor and a holder portion positioned at the a second side of said disc rotor, said holder portion comprising:

(i) first, second and third finger portions which are arranged in this order in the direction of rotation of said rotor when the automobile is moving in a forward direction, said finger portions being arranged on an imaginary plane which is parallel to the second side of said disc rotor, and

(ii) means for reducing braking noise, comprising at least any one of the finger portions being of a different size and configuration from the other of said finger portions and a pitch between said first and second finger portions which is different than the pitch between said second and third finger portions;

(d) two identical piston units which are mounted parallel to said base portion of said caliper;

(e) an inner brake shoe movably mounted between the first side of said disc rotor and each of said piston units so that

upon operation of said piston units, said piston units press said inner brake shoe against one face of said disc rotor, said inner brake shoe including opposed ends which are slidably engaged with said inner side of each of said arm portions of said carrier respectively; and

(f) an outer brake shoe movably mounted between the second side of said disc rotor and said holder portion so that upon operation of said piston units, said piston units move said caliper and thus said holder portion and said outer brake shoe, said outer brake shoe making contact with the other face of said disc rotor, said outer brake shoe including opposed ends which are slidably engaged with said inner side of each of said arm portions of said carrier respectively;

whereby the three finger portions of said holder portion are positioned asymmetrically with respect to said outer brake shoe.

4,840,256

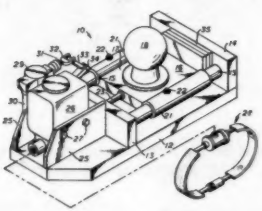
SURGE BRAKE APPARATUS FOR GOOSENECK TRAILERS

James E. Webb, 13809 Hershie St., Houston, Tex. 77015

Filed May 5, 1988, Ser. No. 190,656

Int. Cl.[4] B60T *7/20*

U.S. Cl. 188—112 R **15 Claims**



1. A trailer hitch for actuating the hydraulic brakes of a wheeled trailer responsive to the relative movement between a two vehicle and the trailer being towed comprising:

a hitch member having a base plate adapted to be affixed to the tow vehicle and a second plate movably mounted thereon for longitudinal movement relative to the base plate and the tow vehicle and the second plate having trailer connecting means thereon which moves therewith and which is adapted to receive the tongue portion of the wheeled trailer,

said second plate slidably mounted and supported on a pair of elongate cylindrical rod members secured on said base plate in a parallel spaced relation above the top surface thereof and movable relative to said base plate upon relative movement between the towed trailer and the tow vehicle,

a master hydraulic cylinder removably mounted on said base plate stationary relative to said second plate and connected by conduit to the hydraulic brakes of the towed trailer and having a movable piston therein for creating a hydraulic fluid pressure to actuate the hydraulic trailer brakes,

actuating means carried on said second plate and operatively connected to said master cylinder piston whereby forward movement of said second plate relative to said master cylinder will cause said actuating means to pressurize the fluid therein to activate the wheel brakes of the trailer as the tow vehicle is slowed down, and

releasable lock means for selectively preventing relative movement between said movable trailer connecting means and said master cylinder whereby the trailer may be backed up by the tow vehicle without actuation of the trailer brakes.

4,840,257

BRAKE ADJUSTERS

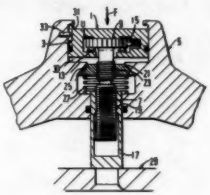
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 936,440, Dec. 1, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 183,361

Claims priority, application United Kingdom, Nov. 29, 1985, 8529473

Int. Cl.[4] F16D *65/56*

U.S. Cl. 188—196 D **9 Claims**



1. An adjuster for use in spring applied brakes comprising a thrust block which is axially slidable in a cylinder bore, the thrust block being rotatably connected to one of two screw threaded adjuster members which are interconnected by a self-sustaining thread, said one adjuster member being provided with a spiral drive thread between the thrust block and said self-sustaining thread, and an axial portion of said one adjuster member being profiled, detent means engaging said profiled portion, the profile of said portion being constructed and arranged that said detent means at all times applies a force to said profiled portion to prevent accidental rotation of said one adjuster member in either direction while allowing rotation thereof when said force is exceeded, a drive ring having a complementary thread meshing with said spiral drive thread with a predetermined amount of axial thread clearance therebetween requiring an amount of relative axial movement between the drive ring and said one adjuster member in one of two axial directions before the meshed threads on the drive ring and on said one adjuster member interengage each other, the drive ring having a tapered outer peripheral surface which can engage a complementary surface on said cylinder bore to form a cone clutch, under the action of a spring, said surfaces interengaging on brake release to cause said one adjuster member to rotate under the action of said spiral thread when said meshed threads have interengaged, said drive ring being rotatable on said spiral drive thread on brake application after said meshed threads have interengaged and the cone clutch has been released.

4,840,258

BRIEF CASE WITH A PORTABLE WIRELESS TELEPHONE

Arifumi Tomikawa, and Nihiko Yasukawa, both of Norcross, Ga., assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 071,966, Jul. 10, 1987, Pat. No. 4,790,417. This application Jul. 15, 1988, Ser. No. 245,393

Int. Cl.[4] A45G *15/00*

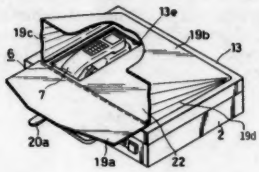
U.S. Cl. 190—102 **3 Claims**

1. A brief case for containing a portable wireless telephone set and other items, comprising:

a base having a first space for accommodating the telephone set and a second space for accommodating said other items, and

a lid assembly capable of being partially opened to permit

access and use of the telephone set, said lid assembly including



a first lid substantially covering the entire base and having an opening over the space for the telephone set; and

a second lid covering at least the opening in said first lid.

4,840,259

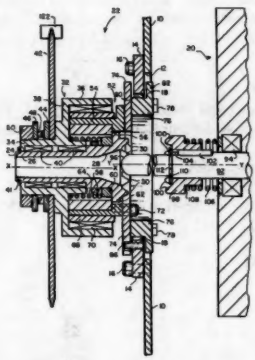
DRIVE MECHANISM FOR A REPRODUCTION APPARATUS

Vladimir S. Guslits, and Steven P. Bailey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1987, Ser. No. 128,313

Int. Cl.[4] F16D *7/02, 11/00, 13/08, 21/08*

U.S. Cl. 192—48.2 **2 Claims**



1. In a reproduction apparatus having a station with a shaft rotatable about an axis, a drive mechanism for rotating the shaft, a plate supporting the drive mechanism, and the station shaft being movable into and out of engagement with the drive mechanism, the drive mechanism comprising:

a coupling having an opening generally aligned with the axis of the shaft for receiving the shaft, the end of the opening facing the received shaft being of frusto-conical shape to accept a slightly misaligned shaft, the end of the coupling having gear teeth extending axially for connecting the coupling to the shaft for conjoint movement,

a rotor positioned around the coupling, means mounting the rotor on the coupling for rotation relative to the coupling,

means connected to the rotor for rotating the rotor relative to the coupling,

a clutch supported by the plate and positioned between the rotor and the coupling, the clutch being effective when energized to couple the rotor to the coupling for conjoint rotation, and the clutch being effective when deenergized to permit the rotor to rotate relative to the coupling,

means for mounting the rotor relative to the clutch so that the rotor can rotate freely when the clutch is deenergized, and

means for supporting the drive mechanism permitting radial movement thereof relative to the plate to compensate for receipt of a misaligned shaft in the opening in the coupling.

4,840,260

BICYCLE FREE-WHEEL STARWHEEL AND FREE WHEEL PROVIDED WITH SUCH A STARWHEEL

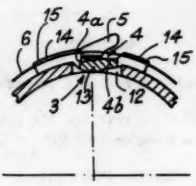
Bernard Josereau, Eu, France, assignor to Etablissements Maurice Maillard, Incheville, France

Filed Aug. 3, 1987, Ser. No. 81,061

Claims priority, application France, Aug. 5, 1986, 86 11325

Int. Cl.[4] F16D *41/30*

U.S. Cl. 192—64 **16 Claims**



1. A bicycle free-wheel starwheel assembly, comprising:

(a) a starwheel (1) constituted by at least one thin, stamped member,

(b) a plurality of spaced, recessed receptacles (3,4) disposed around an outer periphery of the starwheel, and individually mounted thereon,

(c) a plurality of spring biased pawls (5) individually pivotally disposed in the receptacle recesses for interlocking the starwheel, in one direction of rotation, with an outer ring (21) of a sprocket wheel within which the starwheel is rotatably journaled.

4,840,261

AUTOMATIC TRANSMISSION HAVING CENTRIFUGALLY OPERABLE DRAIN VALVE IN HYDRAULICALLY OPERATED CLUTCH ACTUATOR

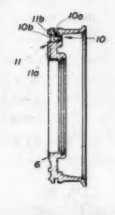
Toshikazu Oshidari, Yokosuka; Noboru Hattori, Miura, and Yoshiaki Kato, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 1, 1987, Ser. No. 127,253

Claims priority, application Japan, Dec. 4, 1986, 61-287628

Int. Cl.[4] F16D *25/12*

U.S. Cl. 192—106 F **7 Claims**



1. In an automatic transmission having a clutch drum, a planetary gear unit and a clutch mechanism which selectively engages said clutch drum and said planetary gear unit,

a hydraulic actuator for actuating said clutch mechanism by using a hydraulic pressure, which comprises:

a means defining a chamber defined said clutch drum;

a piston operatively disposed in said chamber to form a fluid work chamber, said piston actuating said clutch mechanism when said fluid work chamber is filled with a pressurized fluid;

a drain valve including a drain bore formed in the piston

having one end exposed to said fluid work chamber and a valve ball movably interposed in said drain bore in such a manner that when said fluid work chamber is filled with a pressurized fluid, said ball closes said drain bore; and

flow straightening means for straightening flow of the fluid toward said drain bore in order to suppress formation of vortex flow of the fluid in said fluid work chamber about a mouth of said drain bore, said flow straightening means being a structure which is exposed to said fluid work chamber near the mouth of said drain bore, said structure including vanes which are integrally formed on said piston in a manner to extend radially outwardly from said drain bore of said drain valve relative to an axis of said drain bore.

4,840,262

CLUTCH PLATE

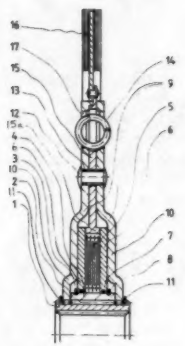
Gert Herrmann, Solingen, Fed. Rep. of Germany, assignor to Uni-Cardan AG

Filed Oct. 26, 1987, Ser. No. 113,059

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637382

Int. Cl.[4] F16D *3/80*

U.S. Cl. 192—106.2 **3 Claims**



1. A clutch plate comprising a hub; side plates rotationally fast with the hub; a lining carrier element supported between the side plates for limited rotational movement relative thereto; spring means for resisting such rotational movement; and a viscous shear coupling comprising a housing with an inner part rotationally fast with the hub, an outer part rotatably supported on the inner part and rotationally fast with the lining carrier element, and containing a viscous liquid and a plurality of interleaved plates alternately fast with the inner and outer parts, said viscous shear coupling transmitting torque only up to an equilibrium position at which torque on said lining carrier element is balanced by the forces exerted by said spring means.

4,840,263

HYDRAULIC CONTROL DEVICE FOR 4WD TORQUE DISTRIBUTION CLUTCH PROVIDING STABILIZED PRESSURE CHARACTERISTICS

Nobuyuki Kato; Tokuyuki Takahashi, and Hiroshi Itoh, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 14, 1987, Ser. No. 95,883

Claims priority, application Japan, Oct. 6, 1986, 61-237631; Oct. 23, 1986, 61-252229

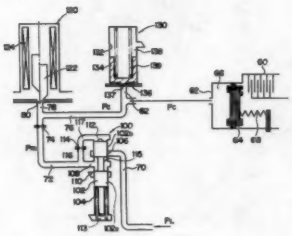
Int. Cl.[4] F16D *25/14*; B60K *17/34*

U.S. Cl. 192—109 F **10 Claims**

1. For a hydraulically actuated torque distribution clutch in a four wheel drive device in a power train of an automotive vehicle:

a hydraulic fluid pressure control device, comprising:

(a) a means for producing a control hydraulic fluid pressure for actuating said torque distribution clutch according to an oscillatory release of part of hydraulic fluid pressure supplied from a source of hydraulic fluid pressure;



(b) an output conduit for conducting said control hydraulic fluid pressure from said control hydraulic fluid pressure producing means toward said torque distribution clutch; and

(c) an accumulator type hydraulic fluid pressure damper connected to said output conduit for smoothing hydraulic pressure fluctuations caused in said output conduit by said oscillatory release of hydraulic fluid.

4,840,264

DEPOSIT SYSTEM INSTALLATION FOR TROLLEYS

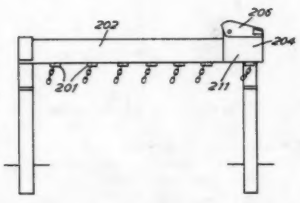
Claude Chappoux, Mornant; Bernard Rouesnel, Ecully, and Guy Gillet, Deols, all of France, assignors to Ronis S.A. and Super Market Systems, both of, France

Filed Jul. 30, 1987, Ser. No. 79,796

Claims priority, application France, Aug. 4, 1986, 86 11255; Feb. 17, 1987, 87 01992

Int. Cl.[4] G07F *7/00*

U.S. Cl. 194—212 **8 Claims**



1. Deposit system installation for transport trolleys, comprising, a locking line constituted by a substantially horizontal bar, deposit system apparatuses, each connected to a trolley, whereby there is cooperation of longitudinal sliding within the line, each deposit apparatus comprising a coin system arranged to permit separation of an apparatus from said locking system by the introduction of a deposit such as a coin into said apparatus, the liberation of the deposit being produced by the passage of said apparatus over a decoding station forming part of the locking line;

wherein the deposit system apparatus comprises a rotor fast with a control knob and with a locking cam, a plurality of pistons returned by springs locking the rotor in cooperation with counter-pistons sliding in a casing of the apparatus, opposite extremities of the counter-pistons being able to cooperate with a profile of the decoding station in order to unlock the rotor;

wherein the rotor comprises at least one longitudinal locking piston arranged to be brought into the unlocking position by the deposit against the action of a spring, the rotation of the unlocked rotor blocking the locking piston which retains the deposit;

wherein the deposit system apparatus slides on a profile bar and passes beneath a decoding head.

4,840,265

OBJECT DISTRIBUTING AND SUPPLYING METHOD AND APPARATUS

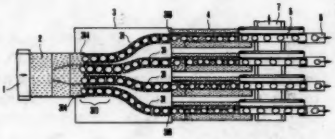
Yasuhiro Sato, and Kazuo Haraguchi, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Maki Seisakusho, Shizuoka, Japan

Filed Aug. 18, 1987, Ser. No. 86,711

Claims priority, application Japan, Aug. 29, 1986, 61-202822; Sep. 5, 1986, 61-136492[U]; Sep. 16, 1986, 61-141554[U]

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—446 3 Claims



1. A method of distributing and conveying ball-like objects which are easy to roll and are soft and suspectible to damage, such as fruit and vegetables, in a generally horizontal running direction, to apparatus spaced downstream in the running direction from the preceding process line wherein the objects are received in a random manner from the preceding process line, comprising the steps of arranging a plurality of conveyors curved in the generally horizontal running direction and extending in the running direction between the preceding process line and the apparatuses, providing each conveyor with a starting end and locating the starting ends for forming a wide receiving part common to each of the conveyors at the preceding process line, providing the conveyors with a plurality of conveying elements with an upper part and a front end and a rear end spaced apart in the running direction so that the conveying elements receive the objects, forming a carrying surface on the upper part of the conveying elements with the carrying surface having a plurality of fin-shaped flexible and elastic projections extending in the running direction and spaced approximately equidistantly apart in the direction extending transversely of the running direction, inclining the carrying surfaces inwardly transversely of the running direction to a flat central part of the carrying surface so that the objects roll on the inclined surfaces to the central part, providing notches in the thin-shaped projections for preventing the objects from rolling in the running direction, distributing the objects from the preceding process line to the wide receiving parts and then to the starting ends of the conveyors, moving the objects on the carrying surfaces of the conveying elements on the conveyors along curved conveying paths diverging from one another in the running direction from the preceding process line to the appraratuses for forming a separate row of the objects on each conveyor, and conveying each row of objects from a terminating end part of the conveyor to one of the apparatuses for movement from the terminating end in a streamline manner.

4,840,266

METHOD AND DEVICE FOR CONTROLLING THE VACUUM IN A SUCCESSION OF SUCTION CONVEYORS

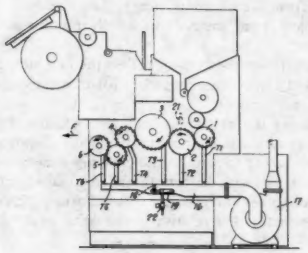
Gian L. Gherardi, Medicina, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Mar. 28, 1988, Ser. No. 174,350

Claims priority, application Italy, May 15, 1987, 12488 A/87

Int. Cl.[4] A24C *5/00*; B65G *29/00*

U.S. Cl. 198—471.1 5 Claims



1. An apparatus for conveying articles comprising:

a succession of endless conveyors, the articles being individually held by suction on one said conveyor and then transferred to a succeeding said conveyor, each said conveyor including suction holes and a suction chamber to which said suction holes are successively connected for a predetermined fraction of a cyclic movement of said conveyor to hold the article to said conveyor during that fraction of movement; and

a vacuum generating means for generating a vacuum for each of said suction chambers and including a distributor means for distributing the vacuum to each said suction chamber and a control means for sensing a leading end of a flow of the articles upon a starting of the conveying of the articles and for connecting at least one said suction chamber through said distributor means to said vacuum generating means by a successive step and progressively just in advance of a receipt by the associated said at least one said conveyor of the leading end of the flow of the articles.

4,840,267

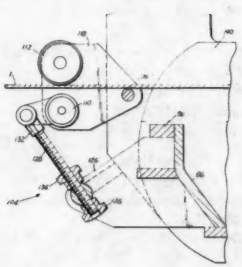
METHOD AND APPARATUS FOR CLEANING A CONVEYOR BELT

Bob G. Pine, Chagrin Falls, Ohio, assignor to Applied Techniques Inc., Chagrin Falls, Ohio

Filed Jan. 9, 1987, Ser. No. 1,913

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—498 15 Claims



1. Apparatus for the removal of material disposed on a

conveyor in the form of a flexible sheet-like, imperforate belt, comprising:

a rotatable cleaning roller disposed adjacent one side of the belt, the cleaning roller extending across the wodth of the belt and being maintained in a stationary position relative to the belt;

a biasing roller disposed on the opposite side of the belt from the cleaning roller, the biasing roller extending across the width of the belt and being movable relative to the belt and the cleaning roller for displacing the belt toward or away from the cleaning roller;

a stationary frame member to which the cleaning roller is secured;

end supports for the biasing roller, the end supports being mounted to the frame member for movement relative to the frame member;

a connecting bar extending between and connected to the end supports, the connecting bar being disposed on that side of the belt closest to the cleaning roller; and

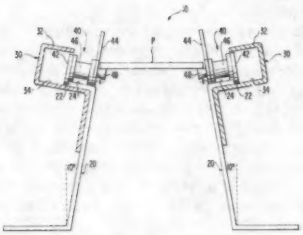
a threaded, rotatable shaft in threaded engagement with the connecting bar and the frame for adjusting the position of the connecting bar relative to the belt.

4,840,268

ADJUSTABLE WIDTH CHAIN CONVEYOR

Albert W. Zemek, Windsor, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Aug. 23, 1988, Ser. No. 235,159
Int. Cl.[4] B65G *15/00*
U.S. Cl. 198—817 **6 Claims**



1. A self-adjusting chain conveyor device for accommodating conveyed items of varying effective widths and compensating for misalignment of the conveyor beyond the tolerances permitted by the item support surface area, said device comprising:

a chain having spaced chain portions for supporting the items;

support means for slidably supporting said chain portions thereon, said means including a pair of supports inclined toward each other and spaced a predetermined distance apart;

means for limiting the downward slide of said chain portions on each of said support means; and

means for preventing said chain portions from tipping off of each of said support means.

4,840,269

APRON TYPE CONVEYOR

William B. Anderson, Oconomowoc, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Mar. 28, 1988, Ser. No. 174,009
Int. Cl.[4] B65G *17/10*
U.S. Cl. 198—822 **8 Claims**

1. An apron type belt conveyor comprising,

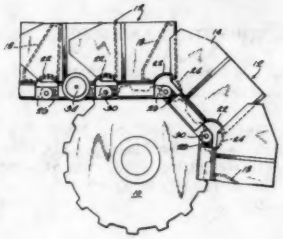
a plurality of pivotally interconnected chain links mounted for forward movement generally parallel to the length of the links,

sprockets engaging said links for driving said conveyor,

mutually overlapping pans each mounted on a chain link and having a pitch which equals the spacing between successive chain links,

said pans being movable in a forward direction with said conveyor,

the forward portion of each pan being elastic and formed to provide a large transverse arcuate bead and the trailing portion of each pan being elastic and formed to provide a small transverse arcuate bead,



said large and small beads having different centers and the forward edge of each large bead overlapping and being biased into contact with the small bead on the pan next ahead to flex the beads within their elastic limits at all times during operation and as the conveyor passes over said sprockets,

an end plate on each end of each said pan,

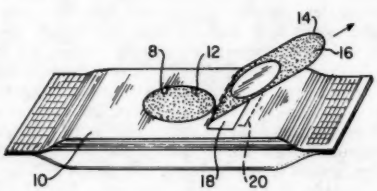
the front of each end plate and the rear of the next forward end plate being shaped to overlap and engage each other at all times during operation.

4,840,270

RE-SEALABLE LABEL FLAP

Garry L. Caputo, Rutherford, N.J.; Thomas A. Saldarelli, and William E. Dwan, both of Yorktown Heights, N.Y., assignors to Nice-Pak Products, Inc., Orangeburg, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,940
Int. Cl.[4] B65D *81/24*
U.S. Cl. 206—205 **5 Claims**



1. A package having an opening and a resealable label flap for sealing the opening, said package comprising:

an enclosure portion for housing contents, said enclosure having a first sealing surface;

an opening in said enclosure for accessing said contents;

a label flap having a second sealing surface for selectively sealing said enclosure portion by covering said opening;

a roughened area located on said first or second sealing surface, said area formed by a corona discharge and providing a surface capable of bonding to a pressure sensitive, non-thermal adhesive more strongly than the area of said sealing surface not treated by corona discharge; and

an adhesive applied between said label flap and said enclosure for adhering said first sealing surface to said second sealing surface such that said opening can be sealed by said label flap, said flap being secured to said enclosure by the stronger bond created within said roughened area of said sealing surface, said roughened area, with said adhesive, functioning as a label stop.

4,840,271

IMPROVED THERMOPLASTIC SKIN PACKING MEANS

Anthony J. M. Garwood, Bayswater, Australia, assignor to Garwood, Ltd., Victoria, Australia

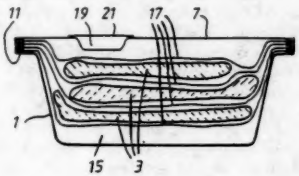
PCT No. PCT/AU86/00339, § 371 Date Jun. 19, 1987, § 102(e) Date Jun. 19, 1987, PCT Pub. No. WO87/02965, PCT Pub. Date May 21, 1987

PCT Filed Nov. 7, 1986, Ser. No. 86,046

Claims priority, application Australia, Nov. 14, 1985, PH3406; Feb. 24, 1986, PH4760

Int. Cl.[4] B65D *81/20, 21/00*

U.S. Cl. 206—213.1 **27 Claims**



1. An improved package for perishable goods comprising:
a base over which said goods are placed;
a gas permeable flexible web covering and at least partially skin packing said goods and holding said goods relative to said base, said web being sealed to said base;
a lid positioned over the top of said base and sealed to said base over said flexible web;
a space above said goods formed between said flexible web and said lid; and
a gas retained in said space, said gas selected for enhancing preservation of the packaged goods by permeation of said gas through said gas permeable web.

4,840,272

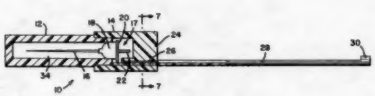
CONTAINER FOR INJECTION NEEDLES WITH SAFETY APPARATUS

Michael C. Goldman, 7801 Connecticut Ave., Chevy Chase, Md. 20815

Filed Aug. 25, 1988, Ser. No. 236,606

Int. Cl.[4] A61M *5/32;* B65D *85/20*

U.S. Cl. 206—365 **4 Claims**



1. A cartridge for housing a syringe needle comprising,
a casing having a generally cylindrical side wall forming a chamber for receiving said needle and having an open end leading into said chamber,
a cap having a cylindrical surface and a channel formed in said surface,
an arm extending outwardly from said side wall and extending through said channel whereby said cap is slidably received on said extension,
a section formed at the distal end of said extension for grasping same and having a cross-section dimension greater than said channel.

4,840,273

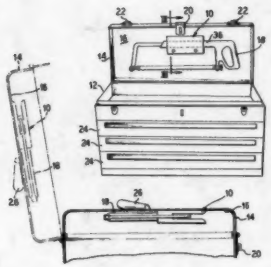
TOOL RETENTION DEVICE

Robert G. Zavacki, 4748 N. Kenneth, 2nd Flr., Chicago, Ill. 60630

Continuation of Ser. No. 72,732, Jul. 13, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,885

Int. Cl.[4] B65D *85/28*

U.S. Cl. 206—372 **13 Claims**



5. A device for removably securing a hacksaw, having a frame, to a movable portion of a tool box comprising:
a single unitary fastening member secured to the movable portion, said fastening member having a base section and first and second upstanding arm sections having proximal and distal ends extending away from said base section and a predetermined distance on the same side of said base section at the respective ends of said base section, said first and second arm sections defining a channel having a width, depth, and length, the channel having a substantially U-shaped cross-section formed by said base section and said first and second upstanding arm sections, the distal ends of the first and second arm sections are beveled toward one another, the width of the channel corresponding to a width of the frame of the hacksaw to be mounted allowing the hacksaw to be removably received within the channel, the first and second arm sections are separated from each other by a distance corresponding to the widest part of a bow-shaped frame portion of the hacksaw, the depth of the channel being at least equal to a height of the frame of the hacksaw to be mounted, and the length of the channel being sufficient to allow the hacksaw to be received within the channel and supported therein; and
the width, depth, and height being so constructed and arranged that the hacksaw is secured within the channel during movement of the movable portion of the tool box merely by being received within the channel without the need for additional fastening means.

4,840,274

PROTECTIVE DEVICE FOR COILS OF METAL

Gary Young, 802 Martha Dr., Franklin, Ohio 45005

Continuation-in-part of Ser. No. 87,705, Aug. 21, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 172,250

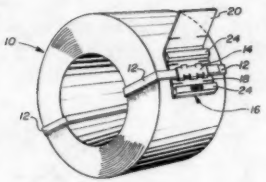
Int. Cl.[4] B65D *85/66*

U.S. Cl. 206—389 **7 Claims**

1. A protective device for a coil of metal including a plurality of sprially wrapped layers of sheet metal held together by at least one band which is retained by a clip, said protective device comprising:
a bottom panel having a portion thereof disposed between the outer layer of said coil of metal and said clip;

a top panel hingable connected to said bottom panel so that said top panel may be opened and closed;

a pair of cushions spaced apart to define a pocket therebetween for receiving said clip, one of said cushions being mounted on said bottom panel while the other one of said



cushions is mounted on said top panel in order to provide maximum space between said cushions when said top panel is opened; and

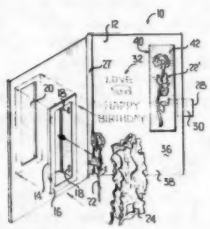
said top panel enclosing said clip in said pocket when said top panel is closed.

4,840,275

GREETING CARD AND PACKAGE

Michael S. Faiola, 18424 Wachs Ter., Olney, Md. 20832, and Richard J. Faiola, 335 N. Forty-Eighth St., Harrisburg, Pa. 17111

Filed Feb. 5, 1987, Ser. No. 10,982
Int. Cl.[4] B65D *85/50*
U.S. Cl. 206—423 **13 Claims**



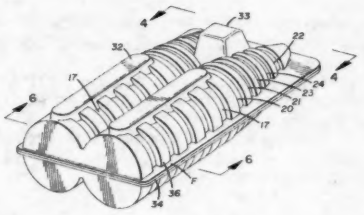
1. A greeting card comprising a sheet of material and a receptacle for receiving and enclosing a gift, means for retaining said gift within said receptacle, means for detachably securing said receptacle to said sheet of material so that said receptacle may be easily detached from said sheet of material without causing visible damage thereto; said receptacle comprising a bubble, an opening formed through said sheet of material, and said bubble being disposed in said opening and protruding from said sheet of material, said receptacle comprising a bubble formed of transparent material, said means for detachably securing said receptacle to said sheet of material being comprised of flange means on said bubble and nib means formed in said bubble, said flange means and said nib means being disposed to secure said sheet of material therebetween, said sheet of material including a front panel and a back panel, said opening being located in said front panel for exposing a portion of said back panel, said portion of said back panel being provided with decorative material which is aligned with said opening and visible through said opening whenever said receptacle is detached from said sheet of material.

4,840,276

CONE PACKAGE

Frederick A. George, Hermitage, Pa., assignor to George & Thomas Cone Company, Hermitage, Pa.

Filed May 25, 1988, Ser. No. 198,439
Int. Cl.[4] B65D *85/36*
U.S. Cl. 206—499 **6 Claims**



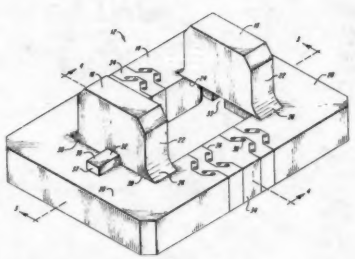
1. An ice cream cone package for holding a number of nested cones therein comprises a pair of identical generally rectangular panels made of a resilient plastic resin material, said panels joined together in hinged relationship at identical ends, a plurality of elongated pockets in each of said panels, said pockets facing one another when said panels are folded in face to face relationship, a plurality of longitudinally spaced arcuate ribs throughout each of said pockets separated by arcuate recesses having flat surfaces, an elongated recessed area formed in each of said pockets inwardly of said identical ends, substantially square recessed areas positioned between and intersecting portions of said, pockets adjacent said identical ends, each of said ribs having a transversely angularly disposed surface in relation to said flat surfaces of said arcuate recesses and an additional area of greater transverse angularly indentations in relation to said flat surfaces of said arcuate recesses, some of said arcuate recessed areas interconnecting to adjoining arcuate recessed areas of an adjacent pocket.

4,840,277

PACKING DEVICE HAVING SUPPORT TAB

Charles Waldner, Georgetown, Mass., assignor to United Foam Plastics Corporation, Georgetown, Mass.

Filed Jun. 14, 1988, Ser. No. 206,423
Int. Cl.[4] B65D *81/04*
U.S. Cl. 206—523 **6 Claims**



1. A foldable plastic packing device, comprising:

a collar, having longitudinal elements and lateral elements, that frames a central cavity,

at least one leg element hingedly connected to a lateral element and pivotable into said central cavity,

said leg element having widened portions to project over said collar and maintain said leg element in a position perpendicular to said collar,

a support tab, hingedly connected to said leg element, positionable between said leg element and said lateral element to assist in maintaining said leg element in a position perpendicular to said collar.

6. A plastic packing device comprising a block of plastic, die-cut to form:

a collar having outer longitudinal elements and outer lateral elements that surround an interior portion,

a leg element in said interior portion, hingedly connected by a first living hinge to one of said outer lateral elements, and pivotable out of said interior portion to a position perpendicular to said collar,

said leg element having widened

portions adjacent said living hinge to project over said collar and maintain said leg element in said position perpendicular to said collar,

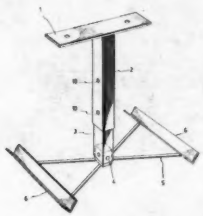
a support tab, hingedly connected to said leg element by a second living hinge colinear with said first living hinge, and pivotable oppositely from said leg element out of said interior portion, to a position between said leg element and said one lateral element to assist in maintaining said leg element in said perpendicular position.

4,840,278

CEILING RACK

Yvon Gelinas, 31 Stéphane, P.O. Box 52, St. Philippe, Quebec, Canada J0L 2K0

Filed May 17, 1988, Ser. No. 195,309
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—18 **9 Claims**



1. A ceiling rack comprising:

a T-shaped attachment member comprising a horizontal bar attachable to the ceiling and a vertical stem projecting down from the bar, wherein said stem consists of a U-shaped channel member having a back side with an upper end and a pair of opposite sides that are parallel to each other and perpendicular to said back side, said opposite sides having upper ends that integrally extend away from the upper end of said back side and are horizontally angled to form together said horizontal bar;

a height adjusting member telescopically mounted to the stem portion, said height adjusting member consisting of a hollow tube that is cross-sectionally square and has a lower end closed by a plug;

securing means to retain the height adjusting member in one of a plurality of vertical settings provided onto the stem;

at least one elongated, horizontal support member on either side of said T-shaped attachment member, each support member having an upwardly open longitudinal channel; and

a frame consisting of a beam having longitudinal lipped edges extending from a valley,

first means to removably attach said beam at mid point thereof to the plug at the lower end of the height adjusting member; and

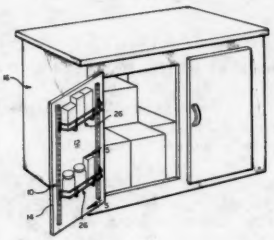
second means to removably attach each support member at mid point thereof to said frame at a given distance from said T-shaped attachment member.

4,840,279

CABINET STORAGE RACKS

Dean L. Cobb, Hoffman Estates, and Edward M. Bleser, Elgin, both of Ill., assignors to Grayline Housewares, Elgin, Ill.

Filed Jul. 19, 1988, Ser. No. 222,702
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—88 **5 Claims**



1. A storage rack for mounting to cabinet doors and the like comprising, in combination:

a pair of brackets of an extended length having a plurality of spaced apart holes therein along the length thereof for receiving therein shelf mounting means for securing shelves to said brackets, said brackets being mounted in spaced-apart parallel relationship and

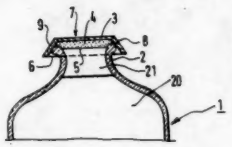
at least one shelf having a front wall, a bottom wall and a pair of adjustably positionable side walls which are free from said bottom wall, each of said pair of side walls being free-standing and the terminal ends thereof having fastening means affixed to them for removably securing said shelf to said brackets, said adjustably positionable permitting said side walls to be positioned to compensate for variations in the spacing between said pair of brackets, whereby said shelves can be more easily and quickly removably mounted to said brackets.

4,840,280

SEALING CAP FOR LIQUID FOOD OR BEVERAGE CONTAINERS

Pascal Schvester, Chicago, Ill., assignor to American Air Liquide, New York, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,498
Int. Cl.[4] B65D *85/72*
U.S. Cl. 215—228 **8 Claims**



1. A sealing cap for liquid food or beverage containers having an enclosed gaseous atmosphere above said liquid food or beverage and adapted for reducing the amount of any gaseous oxygen present in said enclosed atmosphere, the sealing cap comprising

a sealing body with an outer surface adapted to be in contact with the external atmosphere and an inner surface facing the enclosed gaseous atmosphere above said liquid food or beverage,

packing means disposed within the sealing body comprising sealed bag means, said sealed bag means including a first

wall having an outer surface for contact with the enclosed gaseous atmosphere and a second wall having an outer surface for contact with the inner surface of said sealing body, and

absorbing means for gaseous oxygen disposed within the sealed bag means,

said first wall comprising a polymeric film permeable to gaseous oxygen and to water vapor and impermeable to liquids, said film having a permeability to gaseous oxygen of at least 10,000 $cc/m^2 \times bar \times hour$.

4,840,281

TAMPER EVIDENT OPTICAL DEVICE AND ARTICLE UTILIZING THE SAME

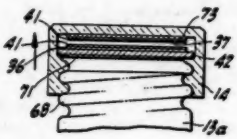
Roger W. Phillips; Vernon C. Spellman; Wayne L. Gossett; Marc A. Kamerling, and Paul G. Coombs, all of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation-in-part of Ser. No. 894,320, Aug. 7, 1986, Pat. No. 4,721,217. This application Jan. 25, 1988, Ser. No. 147,891

Claims priority, application Japan, Jul. 8, 1987, 62-198004; European Pat. Off., Jul. 31, 1987, 87306825.8

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—230 **27 Claims**



1. In a tamper evident optical device having at least first and second layers with a spacer layer therebetween providing a desired optical property and a release layer disposed between the first and second layers to permit the first and second layers to be separated from each other and thereby separate the optical device into two parts and so that the desired optical property is destroyed, said release layer having been formed so that it does not affect to a significant degree the optical properties of the tamper evident optical device.

4,840,282

PRESSURE-RESISTANT TANK

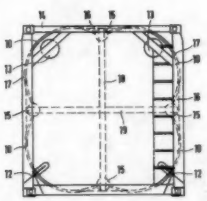
Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH, Weitefeld, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,824

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 8710906

Int. Cl.[4] B65D *88/06*

U.S. Cl. 220—1.5 **9 Claims**



1. A pressure-resistant tank the jacket of which includes

a plurality of longitudinal bars formed with tubular cross-sections and extending parallel to a longitudinal tank axis,

a plurality of part-cylindrical shell elements fitted between respective ones of said longitudinal bars, the axes of said shell elements extending parallel to said tank axis,

a pair of tank heads connected to the ends of said part cylindrical shell elements,

a number of individual tie rods traversing the interior of said tank and interconnecting opposite ones of said longitudinal bars, and

reinforcing pipe sections inserted into said tubular longitudinal bars in the areas in which said tie rods are connected to said longitudinal bars.

4,840,283

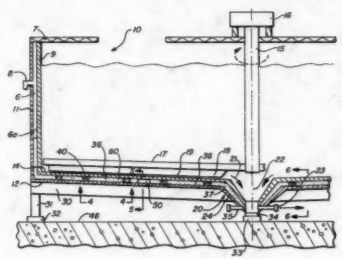
DOUBLE SHELL THICKENER

M. James Lillywhite, Salt Lake City, Utah, and Michael J. Horn, Owensboro, Ky., assignors to Baker Hughes, Houston, Tex.

Filed Nov. 23, 1987, Ser. No. 123,745

Int. Cl.[4] G01M *3/00*

U.S. Cl. 220—5 A **5 Claims**



1. A tank system comprising:

a series of support beams normally placed on a support;

a first series of steel sheet segments supported on and welded to said support beams, said segments forming an outer shell bottom of a tank;

a series of spaced spacer bars positioned on top surfaces of said outer shell bottom and having void spaces extending between said bars;

a load-carrying permeable material filling in said void spaces;

a second series of steel sheet segments supported on said permeable material and having edges mounted on said spaced spacer bars, said second series of segments forming an inner shell bottom spaced from said outer shell;

an upstanding tank wall attached to peripheral portions of said outer and inner bottom shell;

means accessing said void spaces and permeable material for detecting leaks of fluid, confined by said inner bottom shell and said tank wall, into said void spaces and through said permeable material;

a central sludge cone extending from an inner periphery of said first and second series of segments forming said outer shell bottom and said inner shell bottom, said sludge cone comprising spaced concentric inner and outer cone sections having a hollow interior in flow communication with said void spaces; and

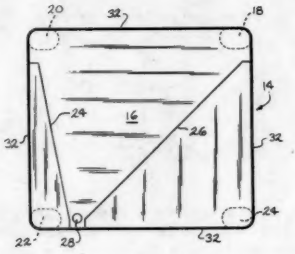
wherein said means accessing said void spaces includes a drainage nozzle accessing said hollow interior of said sludge cone.

4,840,284

SLOPED BOTTOM TANK

Andrew W. Snyder, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.

Filed Jan. 15, 1988, Ser. No. 144,376
Int. Cl.[4] B65D *87/00*
U.S. Cl. 220—5 A **1 Claim**



1. A portable tank for fluid storage and transport having generally vertical sides and a sloped bottom for complete drainage of fluid from the tank comprising:

a generally rectangular bottom plate having upwardly curved side portions that merge with upwardly extending wall portions that terminate in a substantially horizontal upper edge,

said bottom plate having an inner surface and an outer surface and having a discharge opening therethrough, said inner surface having a plurality of smooth contoured surfaces sloped toward said discharge opening and a plurality of creases between said sloped surfaces directed toward said discharge opening to thereby slope substantially all of said inner surface toward said discharge opening,

said side walls being mounted on and secured to said upper edge of said bottom plate,

said outer surface being contoured like said inner surface,

a plurality of feet attached to said outer surface of said plate and positioned at the corners of said plate, each of said feet having a sculptured upper edge conforming in shape to said bottom plate outer surface at the corner of said plate and being secured to said outer surface so that when said feet are resting on a horizontal surface said discharge opening is positioned at the lowest elevation of said bottom plate and said inner surface presents a smooth contoured surface sloping toward said discharge opening.

4,840,285

CABINET CONSTRUCTION FOR A DRYER

Keith E. Carr, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 2, 1986, Ser. No. 914,280
Int. Cl.[4] B65D *6/00*
U.S. Cl. 220—47 **15 Claims**

1. A cabinet construction for a dryer comprising:

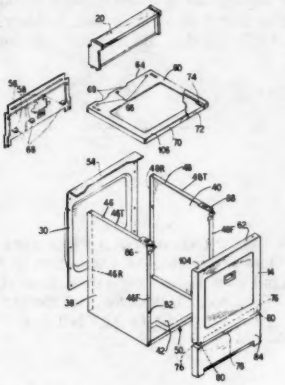
a pair of spaced apart and essentially parallel side panels having back edges, front edges and top edges;

a bottom panel having back edges and side edges permanently attached at either lateral side edge to said side panels;

a rear panel attached to said back edges of said side and bottom panels;

a front panel removably attachable to said front edges of said side panels;

a top panel removably attachable to said top edges of said side panels; and



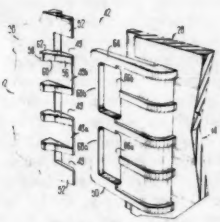
a bracket attached to each side panel adjacent to a junction of said top edge and said side edge, said top panel and said front panel being removably attached to said brackets.

4,840,286

EQUIPMENT ENCLOSURE WITH INTERNAL FASTENERS

James R. Heberling, Lawrenceville; Mark Hicks, Norcross, and Nancy Watts, Marietta, all of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Feb. 23, 1988, Ser. No. 159,069
Int. Cl.[4] H05K *7/20*
U.S. Cl. 220—306 **5 Claims**



1. An equipment enclosure, comprising:

a base having a bottom portion and an upturned peripheral portion connected to said bottom portion and defining a base cavity, said upturned peripheral portion, having a general L-shaped cross-sectioned configuration with a backside of the "L" adjacent said base cavity;

a cover having a top portion and a downturned peripheral portion connected to said top portion and defining a cover cavity, said base cavity and cover cavity forming an enclosure cavity; and

a fastener having a first tooth connected to one of said upturned peripheral portion and downturned peripheral portion, said first tooth having a general right triangular configuration with a longer side affixed to said "L" and having a segmented hypotenuse composed of first second, and third segments, said first segment forming an acute angle with said longer side, said second segment being positioned generally parallel to said longer side, said third segment being positioned between said first and second

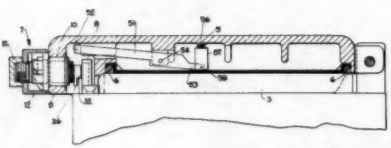
segments, said fastener also having a first detent connected to the other of said upturned peripheral portion and downturned peripheral portion and positioned for sliding engagement with said hypotenuse, said first detent engaging said first tooth in said enclosure cavity and releasably connecting said base and said cover.

4,840,287

LOCKING MECHANISM FOR A PRESSURE COOKER

Edward L. Brewer, and John M. Clark, both of Eaton, Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed Apr. 29, 1988, Ser. No. 188,292
Int. Cl.[4] B65D *45/00*; F24D *1/00*
U.S. Cl. 220—316 **18 Claims**



1. In a pressure cooker having a receptacle with an open end, and a lid hingedly connected to the receptacle for movement from an open position to a closed position, the improvement comprising a locking mechanism adapted to be mounted on the lid and a locking bar adapted to be mounted on the receptacle at the open end thereof for engagement by said locking mechanism, said locking mechanism comprising an elongated locking arm rotatable from a fully open position to a fully closed position, a cam shaft operatively connected to said locking arm for rotation therewith, a locking cam mounted on one end of said cam shaft, and displacement means operative to displace said cam shaft axially from a retracted position to an extended position as said locking arm is rotated from its fully open position to an intermediate position, whereby to position said locking cam for engagement with said locking bar, continued rotation of said locking arm toward the fully locked position causing said locking cam to engage said locking bar, said locking cam being configured to cause the lid to be drawn into sealing engagement with the open end of the receptacle as the locking arm is moved from the intermediate position to the fully closed position.

13. A locking mechanism movable between a fully open position and a fully closed position, said locking means comprising:

a displacement member,

a bearing sleeve rotatably journaled in said displacement member,

a cam shaft slidably journaled in said bearing sleeve,

a locking cam on said cam shaft,

operating means interconnecting said cam shaft and said bearing sleeve for joint rotation, said operating means engaging said displacement member, said displacement means acting through said operating means to axially displace said cam shaft upon rotation of said bearing sleeve, and

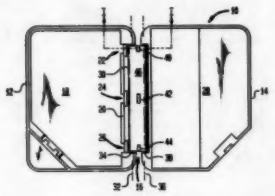
a locking arm connected to said bearing sleeve for rotating said sleeve, whereby said locking cam is moved from the fully open position to the fully closed position upon rotation of said locking arm.

4,840,288

COMPACT CASE WITH IRREVERSIBLE HINGE

William Lunderman, New York, and David Seidler, Forest Hills, both of N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 239,167
Int. Cl.[4] B65D *85/68*
U.S. Cl. 220—334 **12 Claims**



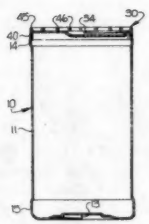
1. A compact case, comprising a base; a lid; hinging means for hinging said lid to said base such that said lid is movable relative to said base between a first position in which said base and said lid are arranged generally back to back and a second position in which said base and said lid are arranged generally face to face, said hinging means including a hinge member pivotable relative to said base about a first pivot axis and pivotable relative to said lid about a second pivot axis, said first and second pivot axes being positioned relative to each other such that said hinge member is movable between an unlocked position, which said hinge member assumes when said lid is in said first position, and a locked position, which said hinge member assumes when said lid is in said second position; and locking means for automatically and non-releasably locking said hinge member in said locked position in response to the pivotal movement of said hinge member relative to said base as said hinge member is moved from said unlocked position to said locked position.

4,840,289

SPIN-BONDED ALL PLASTIC CAN AND METHOD OF FORMING SAME

Roger J. Fait, Ballwin, and Donald H. Ellerbrock, Florissant, both of Mo., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Apr. 29, 1988, Ser. No. 188,445
Int. Cl.[4] B65D *41/00, 13/00*
U.S. Cl. 220—359 **7 Claims**



1. A thermoplastic synthetic all plastic can comprising

(a) a molded plastic can body including a cylindrical side wall portion, a closed bottom, and an open mouth portion extending upwardly from said cylindrical side wall portion and including an inwardly tapering exterior surface, said inwardly tapering exterior surface being inset inwardly from said cylindrical side wall.

(b) a molded plastic end closure member including a circular center panel portion closing the upper end of said can body, and an integrally formed rim portion extending

downwardly from the peripheral portion of said circular center panel, said rim portion including a substantially cylindrical outer wall, and an outwardly tapering interior surface inclined to mate with said inset inwardly tapering exterior surface of said open mouth portion of said can body, said rim portion having a thickness corresponding with the distance said inwardly tapering exterior surface of said open mouth portion is inset from said cylindrical side wall, and

(c) spin-bond means securing and sealingly connecting said mating surfaces of said inwardly tapering exterior surface of said open mouth portion and said outwardly tapering interior surface of said rim portion to securely bond said molded plastic end closure member to said mold plastic can body, and with said cylindrical side wall portion of said can body and said cylindrical outer wall of said end closure member in substantial alignment to thereby provide a smooth continuous appearance along the juncture of said can body and said end closure member.

4,840,290

BULK LOADED COIN DISPENSING MACHINE

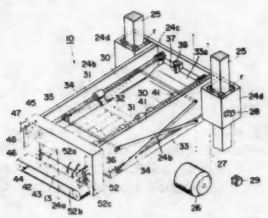
Shunichi Nakamura, Tokyo; Kouichi Iimura, Kawasaki; Kikuo Nakamura, Iruma, and Susumu Ozawa, Niiza, all of Japan, assignors to Kabushiki Kaisha Sigma, Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,547

Claims priority, application Japan, Mar. 1, 1986, 61-42828; Mar. 1, 1986, 61-42829; Mar. 31, 1986, 61-46158[U]; Apr. 3, 1986, 61-48907[U]

Int. Cl.[4] C07F *11/46, 7/04*

U.S. Cl. 221—10 **14 Claims**



1. A coin exchanging machine for exchanging money such as bank notes for coins as money or token coins for game machines, which comprises:

(a) case means;

(b) money inlet means through which money is inserted into the machine, disposed on a front face of the case means;

(c) coin tray means for discharging coin bundles one by one, disposed at a lower portion of a coin accommodating space for piling up vertically a plurality of coin bundles in a state wherein each bundle is laid horizontally;

(d) coin case means disposed detachably at the bottom of the case means for accommodating a plurality of coin bundles in a state wherein each bundle is laid horizontally with the axis of each bundle extending laterally;

(e) coin pushing means for pushing a row of coin bundles laterally at one time by pushing side ends of rows of coin bundles piled up in the coin case means; and

(f) coin transferring means having a conveyor and means to vertically move the conveyor for directly receiving a row of coin bundles pushed by the coin pushing means to transfer the coin bundles into the coin accommodating space located at a position higher than the coin case means, the conveyor being movable vertically in a state wherein the conveyor is horizontally extended in a direction perpendicular to the axis of each coin bundle in the coin case means, a row of coin bundles being received by the conveyor in a stationary state in a position where the conveyor is located along one side face of the coin case means, the means to vertically move the conveyor moving the conveyor, while holding the coin bundles thereon, to a position where the coin bundles on the conveyor are directly fed by the conveyor in the coin accommodating space, one by one, through a coin feeding window in response to consumption of the coin bundles when the conveyor is horiontally driven.

4,840,291

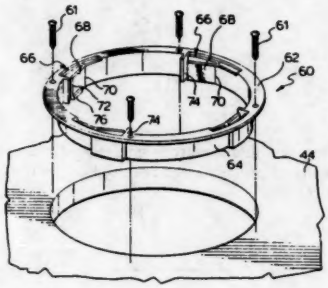
CONTAINER DISPENSING SYSTEM

Dennis Merlin, Thornhill, Canada, assignor to Hillwell Manufacturing Inc., Ajax, Canada

Continuation-in-part of Ser. No. 897,359, Aug. 18, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 211,717

Int. Cl.[4] B65H *1/08*

U.S. Cl. 221—59 **8 Claims**



1. In a container dispensing system, a mounting insert for reception in a flat surface, said mounting insert comprising:

a seating flange having a downwardly extending tubular locating inset at the interior of the seating flange,

said tubular locating inset having a plurality of recesses spaced thereabout with spring fingers disposed therein and extending inwardly at a shallow angle past said tubular locating inset, each finger being connected to a generally vertical edge of one of said recesses with an opposite end of said finger being free and movable into the associated recess,

each recess including an inwardly extending vertical stop face adjacent said free end of said finger.

4,840,292

METHOD AND APPARATUS FOR DISPENSING OIL WELL PROPPANT ADDITIVE

Robert D. Harvey, Rte. 3, Box 177AA, Kilgore, Tex. 75662

Filed Mar. 24, 1988, Ser. No. 172,568

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] G01F *11/24*

U.S. Cl. 222—1 **7 Claims**

6. In a method for delivering an additive to a pressurized fluidized proppant line during delivery of said pressurized, fluidized proppant to a well, the steps of:

sealing a first chamber from the atmosphere;

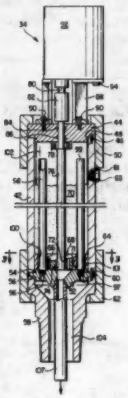
filling said first chamber with an additive through a removably coverable hole in said first chamber;

coupling a second chamber with a pressurized proppant transporting line;

metering additive contained within said first chamber to said second chamber;

equalizing fluid pressure in said second chamber with fluid pressure inside said first chamber using a plurality of conduits disposed within and extending form said first

chamber to said second chamber, such that undesirable turbulence of said additive is reduced; and



dropping said additive from said second chamber to the pressurized proppant transporting line for transportation into the well.

4,840,293

APPARATUS FOR DISCHARGING A BEAD OF PASTY MATERIAL FROM A FLEXIBLE BAG

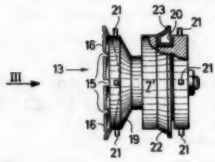
Wilhelm Segatz, Zell, Fed. Rep. of Germany, assignor to ARA - Werk Krämer GmbH & Co., Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,496

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 8620379; Apr. 4, 1987, 8705030

Int. Cl.[4] B65D *88/54*

U.S. Cl. 222—94 **22 Claims**



1. An apparatus for discharging a strand of pasty materials from a deformable tubular container, comprising:

a bag-loadable cylinder, having a front face pointing in a discharge direction of the apparatus, the cylinder having a central outlet aligned with a nozzle connection to the tubular container;

a substantially piston-like pressure member axially displaceable against the tubular container in the cylinder and a device for axial displacement of the pressure member; and,

a pressure relief spring supported on an inner wall of the cylinder and cooperating therewith, the pressure relief spring having radial spring tongues engaging on the inner wall of the cylinder and the pressure relief spring being made from a springy plastic.

4,840,294

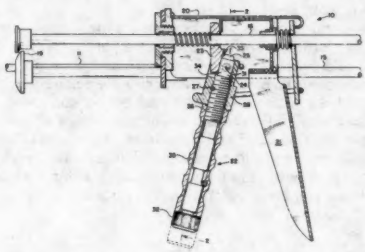
ADJUSTABLE DISPENSING TOOL

Richard J. Ernst, Palatine, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 12, 1988, Ser. No. 155,447

Int. Cl.[4] B65D *5/08*

U.S. Cl. 222—287 **7 Claims**



1. A tool for dispensing fluid, comprising a frame for carrying a cartridge containing a fluid, a pushing rod for reaching into said cartridge, a canted nut surrounding said rod for gripping said rod along its length, a manually operable lever for engaging said canted nut at a given distance from said rod, said lever being adjustable along its axis to vary said given distance, said lever comprising an elongated member at least partially threaded, a rotatable fulcrum threaded to mate with a portion of said member, whereby mechanical advantage provided by said lever may be changed to accommodate fluids of different viscosities.

4,840,295

ROTARY POURING NOZZLE FOR A VESSEL FOR HOLDING MOLTEN METAL

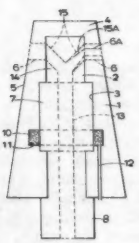
James F. M. Hartley, Cardiff, United Kingdom, assignor to Foseco International Limited, Birmingham, England

Filed Sep. 19, 1988, Ser. No. 246,313

Claims priority, application United Kingdom, Oct. 1, 1987, 8723059

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—598 **13 Claims**



1. A rotary pouring nozzle for a vessel for holding molten metal, comprising a stationary component and a rotatable component sealingly engaged rotatably in said stationary component for rotation relative to said stationary component about a rotational axis fixed with respect to said stationary component, said stationary and rotatable components having interlocking parts inside said stationary component which retain said components together in their working relationships, said stationary component having a flow aperture directed laterally of said rotational axis, and said rotatable component having a nozzle outlet movable into and out of communicating register

with said flow aperture by rotation of said rotatable component relative to said stationary component.

4,840,296

CLAMPING AND FIXING APPARATUS FOR A REFRACTORY-MADE PLATE FOR A SLIDE GATE VALVE FOR CONTROLLING A MOLTEN STEEL FLOW

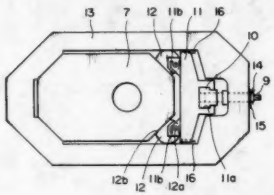
Takashi Otsuka; Masahiko Nose, both of Okayama; Kenji Yamamoto, Bizen; Tadao Taniguchi, Bizen; Yoshifumi Shigeta, Bizen, and Mototsugu Osada, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Japan

Filed Mar. 30, 1988, Ser. No. 175,281

Claims priority, application Japan, Aug. 26, 1987, 62-128492[U]; Nov. 12, 1987, 62-171993[U]

Int. Cl.[4] B22D *37/00, 11/00*

U.S. Cl. 222—600 **4 Claims**



1. A clamping and fixing apparatus for a refractory plate (7) located in a casing (13) of a slide gate valve which controls a molten steel flow comprising:

a guide piece (11) located in the casing (13) having a first side adjacent an end of the refractory place (7) and an opposite second side adjacent an end of the casing (13), said guide piece (11) also having opposite ends adjacent a respective opposite side of the casing (13);

a guide means for guiding said guide piece for movement toward and away from the refractory plate (7) between a clamped position and an unclamped position;

a respective plate-clamping fixture (12) located at a respective said end of said guide piece (11), each said fixture (12) including a peripheral surface which contacts the adjacent side of the casing (13) and said guide piece (11) when said guide piece (11) is moved to the clamped position, as well as a planar portion (12*b*) of said peripheral surface which engages a complementary angled planar surface at the end of the plate (7);

a mounting means (11*b*, 12*a*) for rotatably mounting a respective said fixture (12) to a respective said end of said guide piece (11) for rotation in a plane parallel to the plate (7); and

a moving means for moving said guide piece (11) between the clamped and unclamped positions.

4,840,297

APPARATUS FOR SHIELDING A MOLTEN METAL STREAM

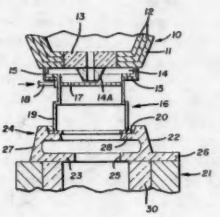
David L. Weekley, Newton Falls, and Ivan Parker, North Canton, both of Ohio, assignors to Vac Tec, Inc., Salem, Ohio

Filed Aug. 5, 1988, Ser. No. 228,737

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—607 **4 Claims**

1. A shroud apparatus for use in pouring molten metal from a metallurgical vessel having an outlet and a metal work assembly to a receptacle maintaining a neutral atmosphere around a molten metal stream comprising, a monolithic ceramic fiber composite body member having an apertured base portion and an integral metal ware registration portion, said registration portion comprising an integral registration ring portion, a continuous wall of a height extending upwardly from said base portion, an inturned self-facing continuous flange on said wall spaced in relation to the horizontal plane defined by the upper free end of said continuous wall, said continuous wall and said inturned self-facing continuous flange defining an aperture of a



dimension greater than that of said aperture in said base portion, an area defined within said self-facing inturned flange, and means for aligning said metallurgical vessel outlet with said shroud and said receptacle.

4,840,298

BICYCLE LUGGAGE CARRIER ATTACHMENT ARRANGEMENT

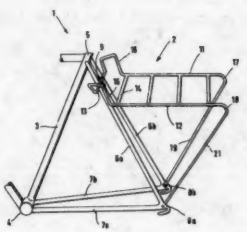
Heinrich Belka, Bielefeld, Fed. Rep. of Germany, assignor to Esge-Marby GmbH & Co., KG, Bielefeld, Fed. Rep. of Germany

Filed Jan. 9, 1987, Ser. No. 1,687

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601387

Int. Cl.[4] B62J *7/00*

U.S. Cl. 224—39 **15 Claims**



1. The combination of

a bicycle frame (1) with

a bicycle luggage carrier (2) and with

an attachment arrangement to attach the bicycle luggage carrier (2) to the frame (1) of the bicycle,

wherein the bicycle frame has

a seat tube (3);

a pair of rear fork elements (6*a*, 6*b*) joined to the seat tube (3),

a cross brace (9, 69) connecting said rear fork elements; and

wherein the luggage carrier (2) has an extending end portion (11, 12, 15, 16,) positioned for attachment to the frame in the vicinity of the seat tube, said end portion including a cross element (13);

said attachment arrangement comprising

a clamping element (22,) located intermediate of the luggage carrier and the bicycle frame and joining the end portion of the luggage carrier (2) to the bicycle frame,

said clamping element being formed with at least one recess (35; 62; 74, 75) defining a recess axis,

the clamping element being shaped and dimensioned to receive at least part of the extending end portion (11, 12, 15, 16, 1;) of the luggage carrier,

the recess axis of the clamping element extending, when the clamping element is associated with a bicycle frame, essentially at right angles to the rear fork elements (*6a, 6b*) of the frame;

releasable clamping means (**41, 42 55, 63, 64, 78**) engaging in said clamping element and positioned on said clamping element, for clamping said at least part of the extending end portion of the luggage carrier in said at least one recess;

wherein the clamping element (**22**) comprises a blocklike structure formed with receiving holes (**36, 37**); and

said at least one recess (**35**) forming a slot extending transversely across with respect to said rear fork elements (*6a, 6b*), said slot having a root or bottom;

the slot and the cross element (**13**) of the luggage carrier (**2**) being dimensioned for reception of the cross element in the slot;

wherein said releasable clamping means comprise clamping elements (**41, 42, 46, 47**) engageable with the cross element and extending into the receiving holes (**36, 37**) formed in said block-like structure of the clamping element (**22**) and engageable with the cross element (**13**) of the luggage carrier (**2**); and

attachment means (**28, 32**;) for associating and attaching the clamping element to the cross brace (**9, 69**).

4,840,299

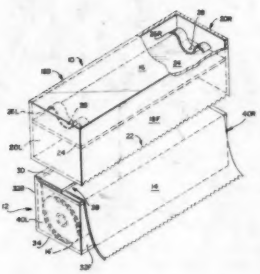
DISPENSER ADAPTER

Jack Burns, 11 N. John St., Pearl River, N.Y. 10965

Filed Apr. 14, 1988, Ser. No. 181,414

Int. Cl.[4] **B26F** *3/02*

U.S. Cl. 225—52 **14 Claims**



1. A dispensing aid for improving the dispensing of thin webs from rolls carried in elongated containers having a top formed of two substantially parallel surfaces, said dispensing aid comprising:

(a) a cover having an elongated top member affixed to front and back members, all joined by a pair of side members to form an open bottomed covering device for fitting over said container;

(b) at least one spring affixed to the underside of said top member;

(c) a pressure applying surface on said spring for applying a distributed array of forces to the top of said container responsive to externally applied force; and

(d) whereby the web being routed through said two parallel surfaces for removal from said roll may be controlled responsive to said distributed forces.

4,840,300

PAPER CONVEYING ROLLER FOR IMAGE FORMING APPARATUS

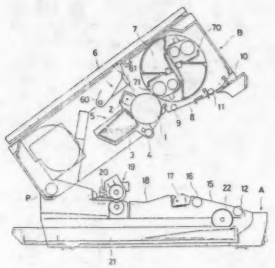
Masaru Tsuji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1987, Ser. No. 27,428

Claims priority, application Japan, Mar. 18, 1986, 61-40211[U]

Int. Cl.[4] **B65H** *5/06, 9/00;* **B41J** *13/02, 13/03*

U.S. Cl. 226—187 **4 Claims**



1. A paper conveying roller device for an image forming apparatus composed of an upper unit rotatably pivoted on a lower unit, having a paper conveying passage formed at the boundary juncture between said upper and lower units, including at least one pair of paper conveying rollers, one of said paper conveying rollers of said at least one pair of paper conveying rollers being disposed on said upper unit of said image forming apparatus and the other of said paper conveying rollers being disposed on said lower unit of said image forming apparatus, wherein at least one of said rollers of said at least one pair of paper conveying rollers is supported by a spring means wherein said spring means passes through the center of said at least one paper conveying roller, each end of said spring means being attached to said image forming apparatus.

4,840,301

FASTENER CONVEYING APPARATUS FOR FASTENER ASSEMBLING MACHINE

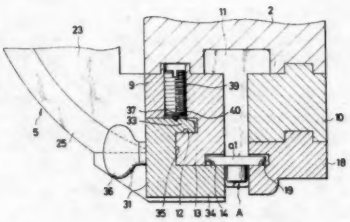
Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,309

Claims priority, application Japan, Aug. 26, 1986, 61-129901[U]

Int. Cl.[4] **A41H** *37/04*

U.S. Cl. 227—139 **7 Claims**



1. A fastener conveying apparatus for an automatic fastener assembling machine having an upper unit, said apparatus comprising:

(a) a base;

(b) a chute fixed to said base and defining a first passageway

for guiding therethrough a plurality of fastener members in succession;

(c) a guide supported on said base and defining a second passageway extending between a lower end portion of said first passageway and the upper unit of the fastener assembling machine for receiving from said first passageway the fastener members one at a time and for guiding the individual fastener member through said second passageway;

(d) a pusher reciprocable in said guide for pushing the fastener member in said second passageway toward the upper unit of the fastener assembling machine; and

(e) said guide including

front and rear parallel guide blocks fixed to said base,

a rear guide part fixed to an underside of said rear guide block, and

a front guide part detachably mounted on an underside of said front guide block, wherein said front guide part has in its top surface a longitudinal V-shaped groove into which balls of at least two ball plungers fixed to said front guide block normally resiliently project.

4,840,302

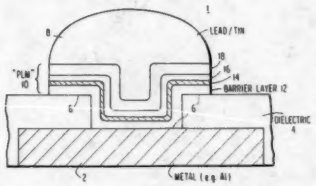
CHROMIUM-TITANIUM ALLOY

David A. Gardner; James G. Ryan, both of Essex Jct.; Joseph G. Schaefer, Berkshire, and Erick G. Walton, So. Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,882

Int. Cl.[4] B23K *1/20;* **H01L** *23/48, 29/54*

U.S. Cl. 228—123 **15 Claims**



1. An alloy layer for contacting portions of a conductive layer exposed through an overlying organic insulator layer disposed on a substrate, consisting of chromium and titanium, wherein at least 50 atm % of the alloy content at a lower surface thereof is titanium.

4,840,303

METHOD AND APPARATUS FOR CUTTING AND WELDING STEEL STRIPS

Mamoru Fujii, Kurashiki; Kazuo Noda, Kobe; Shoji Nagasaka, Kobe; Hiroshi Tajika, Kobe, and Koji Ono, Kobe, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP87/00123, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/05244, PCT Pub. Date Sep. 11, 1987

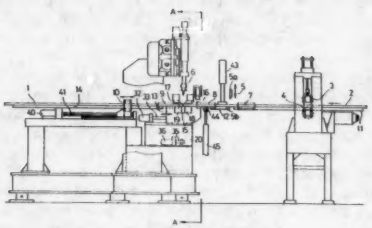
PCT Filed Feb. 26, 1987, Ser. No. 92,913

Claims priority, application Japan, Feb. 28, 1986, 61-43189; Mar. 11, 1986, 61-54406; Dec. 25, 1986, 61-311111; Feb. 9, 1987, 62-29177

Int. Cl.[4] B23K *26/02, 26/10*

U.S. Cl. 228—164 **15 Claims**

1. In a continuous processing line, in which facing ends of preceding and succeeding steel strips are cut and the cut end surfaces are caused to abut as butt surfaces and are welded along the butt line formed by the abutting, a method of cutting and welding steel strips, in which, when cutting, abutting and welding facing ends of the steel strips, at the time of the cutting or abutting prior to the welding, either said preceding steel strip or said succeeding steel strip is attracted by an electromagnetic chuck in at least one work table in said continuous processing line, and said electromagnetic chuck is moved to pull said preceding or succeeding steel strip until it strikes a



reference block disposed parallel to the center line of said continuous processing line to align one edge of said preceding or succeeding steel strip to be parallel to said center line.

4,840,304

BUTT-WELDED CANS AND PROCESS FOR MANUFACTURING THE SAME

Nobuyuki Sato, Yokohama; Hiroshi Matsubayashi, Kamakura; Seishichi Kobayashi, Yokohama; Minoru Mitsuhashi, Yokohama; Kenji Matsuno, Yokohama, and Kazuhisa Ishibashi, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Japan

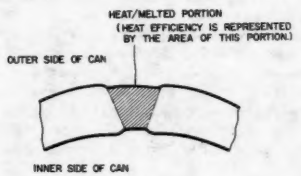
Division of Ser. No. 140,603, Dec. 28, 1987, Pat. No. 4,805,795.

This application Sep. 2, 1988, Ser. No. 239,662

Claims priority, application Japan, Dec. 27, 1986, 61-310194; Jan. 9, 1987, 62-3022; Jan. 20, 1987, 62-10959; Jan. 20, 1987, 62-10960; Jan. 20, 1987, 62-10961

Int. Cl.[4] B23K *26/00, 26/16*

U.S. Cl. 228—214 **16 Claims**



1. A process for manufacturing butt-welded cans which is characterized by comprising the steps of applying a 0.5 to 3.5 μm thick organic resin film for preventing the adhesion of melted metal particles to at least a 1-mm-wide region from the butt-weld portion edges of at least the inner surface of a steel plate can blank having a carbon concentration of 0.02 to 0.09% by weight; and butt-welding the edges of said can blank by the use of a laser.

4,840,305

METHOD FOR VAPOR PHASE SOLDERING

Michael J. Ankrom, Baltimore; Corey H. Bowcutt, Annapolis; John J. Buckley, Jr., Baltimore, and James A. Rew, Millersville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1987, Ser. No. 32,426

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—232 **20 Claims**

1. A method for vapor phase soldering components onto a

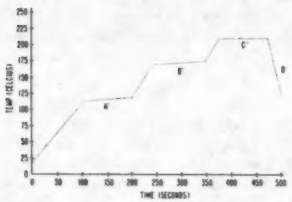
PWB onto which solder has been previously deposited comprising the steps of:

(a) applying a fluxing agent onto the PWB surface to be soldered;

(b) introducing the PWB into a vapor phase environment providing a temperature range between approximately ambient and the temperature of a saturated vapor of at least a first selected fluid in order to heat the PWB as follows:

(c) initially heating the PWB according to a first time-temperature gradient having a first slope value from ambient temperature to a predetermined first temperature selected to activate the flux and permit the flux to outgas before reflow and maintaining the PWB at said predetermined first temperature for a predetermined first period of time;

(d) heating the PWB according to a second time-temperature gradient having a second slope value from said first temperature to a predetermined second temperature selected to preheat the PWB to a temperature which is slightly less than the melting point of the solder and maintaining the PWB at said predetermined second temperature for a predetermined second period of time;



(e) heating the PWB according to a third time-temperature gradient having a third slope value from said first temperature to a predetermined third temperature selected to preheat the PWB to a temperature which is at least equal to the melting point of the solder and maintaining the PWB at said predetermined third temperature for a predetermined third period of time;

(f) cooling the PWB according to a fourth time-temperature gradient having a fourth slope value, said fourth slope value having an absolute value greater than twice the value of any one of said first, second or third slope values, and by reducing the temperature below the third selected temperature so that the solder is in a solid state; and then

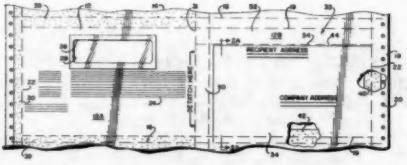
(g) withdrawing the PWB from the vapor phase environment.

4,840,306

FOLD-OVER MAILER WITH SIDE-OPEN RETURN ENVELOPE WITH SLITTABLE EDGE

Leo Lombardo, Manchester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,579
Int. Cl.[4] B65D *27/06, 27/10, 27/34*
U.S. Cl. 229—73 **20 Claims**



1. A mailer having a return envelope, comprising first and second paper plies;

means about the margins of said plies for releasably securing said plies one to the other;

a third paper ply disposed between said first and second plies and having discrete margins;

means about the margins of said third ply for securing said third ply and one of said first and second plies one to the other whereby said intermediate ply and said one ply form a return envelope;

means defining an opening for said return envelope along a margin of said third ply;

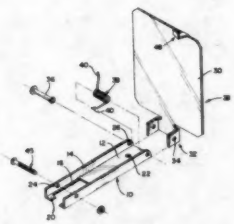
one of the margins of said third ply being reversely folded along a foldline to form a flap disposed between said third ply and said one ply and a line of adhesive disposed between said flap and said one ply to secure said third ply and said one ply one to the other along said one margin whereby an edge portion of said return envelope and including said flap may be slit adjacent said foldline and along the adhesive line to open the return envelope.

4,840,307

POSTBOX SIGNAL

Janet A. Hartman, 1157 Pugh Rd., Wayne, Pa. 19087

Filed May 3, 1988, Ser. No. 189,729
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 **3 Claims**



1. A postbox signal device comprising:

a support plate having integral therewith means for mounting onto a conventional rural type of postbox without the requirement of postbox mutilation, as for instance a postbox aperture to accommodate a fastener, or of additional materials to effect said mounting;

a signal plate pivotally secured at one end to the support plate and foldable thereon to form a compact relatively planar mass adapted for ease of handling;

a spring means biasing the signal plate to an open or unfolded position;

said integral means for mounting comprising horizontally extending opposed tab elements that are adapted to operatively associate with the horizontal section of a conventional postbox latch member for retaining the signal device in operative position on the postbox;

said support plate having an elongated, open-ended slot at the free end thereof, the tab elements being disposed at said open end in the plane of the support plate, and the plate thus configured to facilitate assembly of the device as said relatively planar mass;

said slotted configuration being adapted to receive therethrough a said horizontal section of a conventional postbox latch member whereby said signal device may be easily mounted on said postbox by inserting the latch member through the slot, lifting slightly on the latch member, sliding the tab elements between the latch member and the postbox to an operative position, and then releasing the latch member whereby the signal device is retained at said operative position; and

a tab member extending outwardly from the free end of the signal plate and adapted to operatively associate with the

postbox closure for retention in the folded position and whereby opening of said closure frees the signal plate for movement to an upright position to normally signal a delivery to the postbox.

4,840,308

AUTOMOTIVE AIR CONDITIONING SYSTEM DAMPER POSITION CONTROL

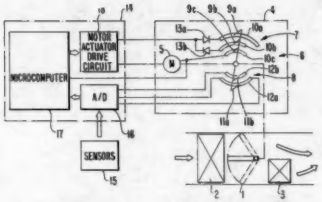
Hidemitsu Akabane, Takasaki; Toshimi Isobe, Isesaki, and Seiichi Hoshino, Nitta, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jul. 18, 1988, Ser. No. 220,740

Claims priority, application Japan, Jul. 18, 1987, 62-109593[U]

Int. Cl.[4] G05D *23/12*

U.S. Cl. 236—13 **2 Claims**



1. In an automotive air conditioning system including an air mix damper which controls the temperature of the air blown into a compartment to be cooled by controlling the mixture of cool air and heated air and a damper position control device, said damper position control device including a motor actuator and a control circuit, said motor actuator including a motor driving the air mix damper and a rotation control switch provided with a regulator regulating upper and lower rotational limits of said motor and a position detector generating position signals corresponding to the rotational angle of the shaft of said motor, said control circuit controlling the operation of said motor actuator in accordance with a plurality of temperature signals, and the position signals, said control circuit initiating control of the operation of said motor actuator upon inputting one of the position signals corresponding to the upper and lower rotational limits of the shaft of said motor, the improvements comprising:

stop determination means in said control circuit for determining whether said motor stops within the upper and lower rotational limits;

regulator control means in said control circuit responsive to said stop determination means for using a position signal from said position detector corresponding to the position at which said motor stops as one of the upper and lower rotational limits of said regulator.

4,840,309

TRACTION MAT

Gaspare Teresi, 142 Fulton Ave., Fairview, N.J. 07022

Filed Feb. 29, 1988, Ser. No. 161,973

Int. Cl.[4] E01B *23/00*

U.S. Cl. 238—14 **5 Claims**

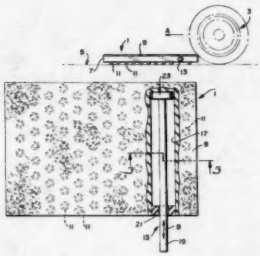
1. A traction mat for a vehicle wheel comprising:

(a) a planar shaped member including upper and lower surfaces;

(b) a plurality of spaced traction cleats extending from the lower surface of the member for engaging a slippery road surface;

(c) the member and cleats being integrally formed from a moldable material;

(d) an elongate recess molded within the member, the longitudinal axis of the recess being disposed transverse to a given direction of wheel travel when the mat is disposed in a position of use; and



(e) an elongate handle coaxially supported within the recess for free slidable movement and disposable in positions of retraction and extension with respect thereto.

4,840,310

FUEL INJECTION NOZZLE

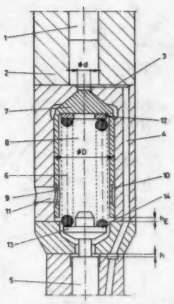
Gottfried Haider, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Oct. 26, 1987, Ser. No. 112,495

Claims priority, application Austria, Oct. 30, 1986, 2893/86

Int. Cl.[4] F02M *47/00*

U.S. Cl. 239—533.4 **5 Claims**



1. A fuel injection nozzle for an internal combustion engine, especially a diesel engine, comprising:

a housing means including a longitudinal passage which has an inlet end for connection with a pressurizable fuel chamber of a fuel injection pump, and an outlet end provided with fuel injection bore means;

said longitudinal passage being provided intermediate said inlet and outlet ends, with a longitudinally elongated valve needle spring chamber which is radially enlarged in relation to said longitudinal passage immediately upstream of a seat provided where said longitudinal passage emerges into said valve needle spring chamber;

a fuel delivery bore provided in said housing means, so as to intersect with said longitudinal passage at a first intersection upstream of, and at a second intersection downstream from, said valve needle spring chamber;

a valve needle longitudinally slidably received in said longitudinal passage and having a spring plate thereof disposed in said valve needle spring chamber;

a piston shoulder formed on said valve needle and exposed to said fuel delivery bore via said second intersection, whereby an increase in fuel pressure applied on said piston shoulder can slide said valve needle longitudinally in one

direction for moving a tip portion of said valve needle axially away from a closing relation in relation to said fuel injection bore means, and upon a decrease in fuel pressure applied on said piston shoulder can permit said valve needle to slide longitudinally in an opposite direction until said valve needle tip portion closes said fuel injection bore means;

a displacer piston longitudinally slidably received in said valve needle spring chamber, said displacer piston having an end wall capable of closing-off and opening said valve needle spring chamber at said seat;

said displacer piston further including a generally tubular sidewall which extends longitudinally from said end wall towards said spring plate;

a stop means provided for engagement by said sidewall upon longitudinal movement of said end wall away from said seat for limiting longitudinal movement of said end wall away from said seat and thereby limiting volume of a space created in said valve needle spring chamber upstream of said displacer piston;

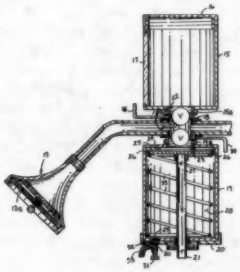
a compression coil spring received in said valve needle spring chamber, said spring having one end pressed against said displacer piston end wall for tending to maintain said end wall seated against said seat, and another end pressed against said spring plate of said valve needle for tending to maintain said tip portion of said valve needle disposed in closing relation to said fuel injection bore means, whereby said spring longitudinally overlaps with said sidewall of said displacer piston, and, in use, first increment of increased pressure on fuel in said longitudinal passage upstream of said valve needle spring chamber may axially slide said valve needle, against counterpressure provided by said spring, to open said fuel injection bore means for a pre-injection of fuel out of said fuel injection bore means, a second increment of increased pressure on said fuel may longitudinally displace said end wall of said displacer piston, against counterpressure provided by said spring, away from said seat, such movement being limited by said stop means, opening said space, thereby temporarily relieving pressure on said fuel and permitting said spring to temporarily reclose said valve needle against said fuel injection bore means, and a third increment of increased pressure on said fuel may axially slide said valve needle a second time, against counterpressure provided by said spring, to open said fuel injection bore means for injection of fuel out of said fuel injection bore means.

4,840,311

SHOWER DISPENSING HEAD

Judy A. Shamblin, 4222 Mohawk, Baytown, Tex. 77521

Filed Jul. 5, 1988, Ser. No. 215,267
Int. Cl.[4] B05B *7/30, 11/02*
U.S. Cl. 239—74 **8 Claims**



1. A shower dispensing head apparatus for selectively supplying bath toiletry fluid through a shower head in full communication with said dispensing head, said dispensing head apparatus comprising,

an upper elongate container removable secured to an upper end of a union, and

a lower elongate container underlying said upper container and removably secured to a lower end of said union, and

said union secured to and in fluid communication with a water conduit directing water to said shower head, and

said upper container including a lid removably secured to said upper container for replenishment of a toiletry fluid in said upper container, and

a first valve positioned in fluid communication between said upper container and an outlet pipe wherein said outlet is positioned within said water conduit for supplying a predetermined quantity of said toiletry fluid within said water conduit, and

said lower elongate container including a lid removably secured to said lower elongate container remote from said union;

said lid including an outlet spigot in fluid communication with a manually manipulatable third valve and plunger extending outwardly of said lid for directing a toiletry fluid within said lower container through said spigot, and

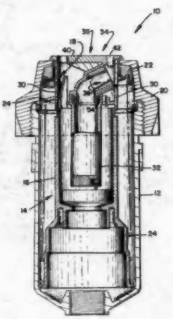
a second valve positioned between said water conduit and a piston within said lower container to pressurize said toiletry fluid within said lower container.

4,840,312

SPRINKLER NOZZLE MODULE

Stephen L. Tyler, Diamond Bar, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Nov. 20, 1987, Ser. No. 123,420
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—205 **1 Claim**



1. A rotating pop-up sprinkler comprising:

(a) a tubular body suitable for connection to a water source;

(b) an elongate tubular riser assembly received within the body and in fluid communication therewith, comprising a lower non-rotating portion and an upper rotating portion rotatably coupled thereto, wherein the riser assembly has retracted and extended states relative to the body, and wherein the upper rotating portion of the riser assembly is cup-like and has a vertical cylindrical wall extending radially inward from which is a pair of diametrically opposed tabs each having a bottom surface;

(c) a ring-like cap threadedly attached to the top of the body having an annular upper rim;

(d) an annular wiper seal captured within the cap and in contact with and underside of the cap rim;

(e) a compression spring acting between on underside of the wiper seal and the non-rotating portion of the riser assembly for urging the riser assembly toward its retracted state; and

(f) a removable nozzle module comprising a nozzle holder and a nozzle received thereby and in fluid communication therewith, wherein:

(i) the nozzle holder comprises an upper lid and a body wherein the body and the lid are integral one to the other; the body forms a nozzle aperture to receive the nozzle; and extending radially from the body is a pair of diametrically-opposed wings each having a top surface, the top surfaces of the wings being suitable for engagement with the bottom surfaces of the riser assembly tabs, whereby partial rotation of the nozzle holder relative to the rotating portion of the riser assembly effects engagement or disengagement of the top and bottom surfaces of the corresponding wings and tabs, respectively, depending on the direction of rotation, thereby resulting in a bayonet connection between the nozzle module and the rotating portion of the riser assembly;

(ii) the upper lid of the nozzle holder is accessible when the riser assembly is in its retracted state and the lid forms one or more apertures for receiving means for applying torque to the nozzle holder, whereby the nozzle module can be twisted relative to the non-rotating portion of the riser assembly and removed without extending the riser assembly; and

(iii) the nozzle aperture is below the rim of the cap and is therefore covered and protected when the riser assembly is in its retracted state.

4,840,313
WATER SPRAY FITTING

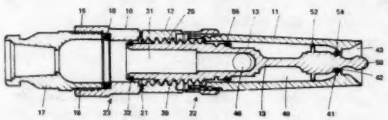
Albert F. Hansen, Whangarei, New Zealand, assignor to Hansen Development Limited, Whangarei, New Zealand

Filed Oct. 14, 1987, Ser. No. 108,495

Claims priority, application New Zealand, Oct. 16, 1986, 217969

Int. Cl.[4] B05B *1/32*

U.S. Cl. 239—456 **6 Claims**



1. A water spray fitting for controlling the flow of water from a pressure water supply, comprising:

a body of said fitting adapted to be connected to said water supply and comprising a hollow interior extending from a water inlet to said interior to a water outlet from said fitting;

an internally threaded control ring located in a transverse cut out part of said body and rotatable therein about its longitudinal axis by force applied manually to an exposed exterior part or parts of said control ring; and

a valve member extending longitudinally within said hollow interior and through said control ring and externally threaded in the region of said control ring such that rotation of said control ring causes longitudinal movement of said valve member within said hollow interior, and comprising a distal end engaging said water outlet to control the flow of water therefrom on movement of said valve member by way of said control ring, and means sealing said valve member to the interior of the fitting on either side of said control ring, and a passage for water internally through said valve member from the water inlet side of said interior through a water outlet port of the member to the water outlet side of the body beyond said control ring, said valve member being formed such that the forces applied to said valve member in use of the fitting by rearwardly directed water pressure acting on said valve member beyond said control ring and forwardly directed water pressure acting on said valve member on said inlet side thereof are substantially balanced.

4,840,314
TREATMENT OF MERCURIAL WASTE

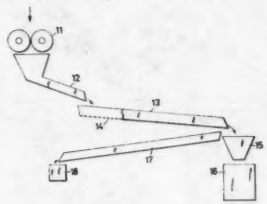
Hans Kulander, Saltvik, Sweden, assignor to MRT System Aktiebolag, Sweden

Filed Mar. 30, 1988, Ser. No. 175,256

Claims priority, application Sweden, Apr. 16, 1987, 8701613

Int. Cl.[4] B02C *19/14*

U.S. Cl. 241—24 **12 Claims**



1. A method of separating mercurial waste from scrapped metal vapor discharge lamps of the type which are coated with luminescent powder on their inside glass surfaces, comprising the steps of crushing the lamps into particles, separating the crushed particles into a relatively coarse first fraction and a relatively fine second fraction, said relatively coarse first fraction having a particle size larger than a range of about 0.2 to 1.0 mm and being essentially free of the mercury in said scrapped lamps, said relatively fine second fraction having a particle size less than said range of about 0.2 to 1.0 mm and containing substantially all of the mercury in said scrapped lamps, said separation step being performed with the use of vibrating screen means, and both of said steps of crushing and separating being performed dry and on essentially said scrapped lamps only.

4,840,315
METHOD AND INSTALLATION FOR A CONTINUOUS PRESSURE COMMUNUTION OF BRITTLE GRINDING STOCK

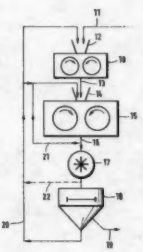
Gerhard Rubin, Cologne, and Hugo Bleckmann, Bonn, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,256

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719251

Int. Cl.[4] B02C *4/00*

U.S. Cl. 241—24 **17 Claims**



1. A method for the continuous pressure comminution of brittle grinding stock such as cement clinker, ore, coal of the

like using a high-pressure roller in whose narrowest nip the grinding stock is subjected to a product bed comminution, the comminuted product is de-agglomerated, the fine finished product is classified out of the de-agglomerated product in a sifter, and the coarse fraction is recirculated for delivery into the roller press, characterized in that the agglomerates delivered from the roller press are pressed at least a second time in the nip of a further roller press before de-agglomeration so that the pressure pattern in the second roller nip becomes narrower in the circumferential direction but higher in amplitude.

4,840,316

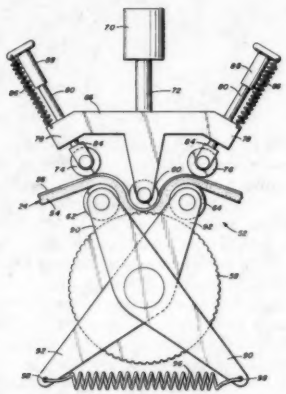
RUBBER CRUMB RECOVERY FROM VEHICLE TIRES

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Filed Jul. 13, 1988, Ser. No. 218,687

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—279 **20 Claims**



1. An apparatus for removing rubber from a tire segment of the type having a threaded portion fixed to a belted underlayer, comprising,

a rasp having an axis of rotation,

means for rotating said rasp about said axis,

a capture roller having a tire engagement position wherein said capture roller is adjacent to said rasp to maintain a thread portion of a captive tire in frictional contact with the circumference of the rasp,

first and second tensioning rollers mounted on parallel shafts at opposed sides of said capture roller when said capture roller is in said engagement position, said tensioning rollers each having an operating condition in which the tensioning roller is spaced apart from said capture roller by frictional contact with a captive tire placed therebetween, and

drive means for providing relative movement between said rotational axis of the rasp and said captive tire as the treaded portion of said captive tire is removed from a belted underlayer.

4,840,317

WOOD PULP GRINDER

Hans-Otto Henrich, Hiedenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,252

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636226

Int. Cl.[4] B02C *19/12*

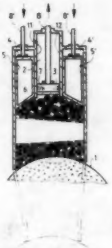
U.S. Cl. 241—282 **20 Claims**

1. A wood pulp grinder comprising a grinder housing having an open end facing toward a grindstone for delivering wood to be ground to the grindstone;

a main press chamber in the grinder housing spaced above the grindstone; a main press ram guided for movement toward and away from the grindstone through the main press chamber, and when the main press ram is moved away from the grindstone, wood may be loaded into the main press chamber;

an auxiliary press ram at a side of the main press chamber in the grinder housing, the auxiliary press ram having an active end for pressing upon wood in the grinder housing, the auxiliary press ram being movable separately from the main press ram over pressing stroke toward and away from the grindstone;

the main press ram having a first active lower surface for pressing upon wood in the grinder housing and the main press ram having a pressing stroke during which said first



active lower surface presses upon wood in the grinder housing and the pressing stroke of the main press ram having an end of motion at which the active surface of the main pressing ram is nearest the grindstone, the auxiliary press ram having a second active surface for pressing upon wood in the grinder housing and the auxiliary press ram having an active stroke during which said second active surface presses upon wood in the grinder housing, the second active surface being located, at least at the beginning of the active stroke of the auxiliary press ram, toward the grindstone, at a height generally near the height of the first active surface of the main press ram at the end of the active stroke of the main press ram where the first active surface is closest to the grindstone;

said auxiliary press ram maintaining pressure upon wood in the grinder housing while the main press ram is moved away from the grindstone to load wood into the main press chamber.

4,840,318

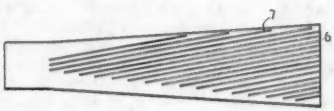
WELDED CONICAL GRINDING CUTTER

Helmer Gustafsson, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Oy Jylhavaara, Valkeakoski, Finland

Filed Jan. 7, 1985, Ser. No. 689,474

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—294 **6 Claims**



1. A conical grinding cutter for the grinding or refining of wood pulp, comprising

a plurality of separately cast cutter sectors formed of a first material providing a long service life, each having been

cast into a curved rigid configuration with a plurality of integrally cast ridges in the surface thereof, and each said sector having along its longitudinally extensive edges at least one junction piece formed of a second material which is weldable, each said sector being cast about and partially embedding said at least one junction piece,

said cutter sectors being assembled adjacent one another along said longitudinally extensive edges to define a cone including a grinding portion constituted by a longitudinally extensive surface provided with said integrally cast ridges,

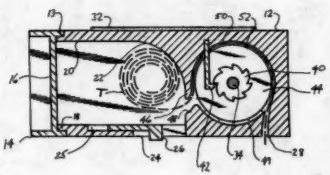
said cutter sectors being welded together along said weldable junction pieces to obtain a stiff and rigid conical grinding cutter.

4,840,319

BAG TIE DISPENSER

Harold E. Heleen, and Lucille M. Heleen, both of P.O. Box 21, Thomasville, Ga. 31799-021

Filed Jan. 28, 1988, Ser. No. 149,359
Int. Cl.[4] B65H *19/00*; G03B *1/24*
U.S. Cl. 242—55.53 **3 Claims**



1. A new and improved bag tie dispenser, comprising:

a hollow generally rectangular housing;

a lid removably received on a top portion of said housing;

a loose tie storage receptacle on an upper surface of said lid;

said housing having a tie feed hopper with a straight back vertical interior wall;

a lower portion of said back vertical wall connected by a curved support surface to a generally horizontal radiused guide lip;

a cylindrical recess in said housing disposed beneath said horizontal radiused guide lip;

a feed gap communicating between said tie feed hopper and said cylindrical recess;

a cylindrical feed roller rotatably mounted in said cylindrical recess;

said feed roller having an outer peripheral surface provided with a plurality of axially extending evenly circumferentially spaced slots;

each of said slots having a width of about three thirty seconds of an inch and a depth of about three hundredths of an inch;

said feed roller having a maximum diameter dimensioned to form a slight spacing between said roller and a wall of said cylindrical recess;

a generally horizontal slot formed through a front wall of said housing;

said slot tangentially connected with said cylindrical recess;

an aperture formed through said front housing wall;

said aperture in communication with said tie feed hopper;

a slidable cover on said housing for selectively opening and closing said aperture;

means for manually rotating said feed roller; and

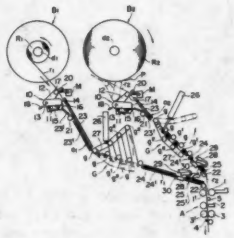
adhesive means on a back exterior wall of said housing for securing said dispenser to a vertical surface.

4,840,320

APPARATUS FOR AUTOMATICALLY THREADING THE LEADING EDGE OF A SPOOLED WEB INTO A CONVEYING PASSAGE

Toshio Shigeta, Chiba; Yoshiyuki Muto, and Tadao Etani, both of Tokyo, all of Japan, assignors to Japan Tobacco Inc. and Tokyo Automatic Machinery Works Ltd., both of Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,365
Claims priority, application Japan, Dec. 25, 1986, 61-312561
Int. Cl.[4] B65H *19/16, 19/18*
U.S. Cl. 242—58 **11 Claims**



1. Apparatus for automatically threading the leading end of a web spooled on a reel into one end of a conveying passage, said apparatus comprising:

(a) a draw-out lever having a web support surface and movable to a first position at which said support surface engages the web spooled on the reel;

(b) a nipping finger actuatable to trap the leading end of the web against said surface when the lever is in its first position;

(c) said lever being movable to a second position in which said support surface is spaced from the web spooled on the reel for unspooling the web from the reel;

(d) feed means made effective after said lever has moved to its second position and after said nipping finger is deactuated for engaging the unspooled web and feeding the leading end thereof into said conveying passage;

(e) said draw-out lever including a guide lever fixed to said draw-out lever and carrying a back-up roller on its free end positioned to engage the web unspooled from the reel when said lever is in its second position:

(f) said feed means including a feed roller movable into engagement with the web unspooled from the reel for trapping the unspooled web against the back-up roller; and

(g) means for rotating said feed roller.

4,840,321

APPARATUS FOR FEEDING PACKAGING-MATERIAL REELS TO A PACKAGING MACHINE

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

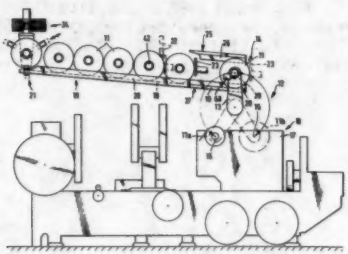
Filed Sep. 11, 1987, Ser. No. 95,594
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631205
Int. Cl.[4] B65H *19/12, 16/04*
U.S. Cl. 242—58.6 **19 Claims**

1. Apparatus for transferring and feeding reels of packaging material to a reel-changing device of a packaging machine, the real-changing device having at least one supporting journal which projects from a reel supporting frame and which penetrates into a central orifice in the reel for the mounting of the latter; said apparatus comprising:

means for mounting said supporting journal (**15, 16**) on said reel supporting frame (**17**), so as to be axially displaceable,

and for pushing said journal (15, 16) from a retracted initial position into an extended position in a central orifice (42) in the reel (11) to receive the reel supplied in a working plane;

a pivotably mounted conveying arm (13) for feeding the reels (11) of the reel-changing device (12); and



a transversely projecting reel conveying journal (28) which is arranged on said conveying arm (13) and which is axially displaceable in order to receive a reel in a transfer station (14) and to deliver the reel to the reel-changing device (12).

4,840,322

WINDING OF FLEXIBLE ELONGATE MATERIAL

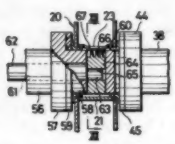
Yuichi Masuda, Namerikawa, and Kozo Shimizu, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Division of Ser. No. 859,490, May 5, 1986, Pat. No. 4,742,969. This application Feb. 24, 1988, Ser. No. 159,928

Claims priority, application Japan, May 17, 1985, 60-105576

Int. Cl.[4] B65H *18/10*

U.S. Cl. 242—67.1 R **7 Claims**



3. An apparatus for winding a flexible elongate material, comprising:

(a) a spool for winding thereon the flexible elongate material, including a hollow cylindrical body having an axial hole extending from end thereof and defined by an annular peripheral wall of said spool body, and a radial opening extending through said annular peripheral wall and communicating with said axial hole;

(b) a pair of oppositively disposed first and second drive shafts relatively movable toward and away from each other for releasably holding said spool, said first and second drive shafts being rotatable about their own axes to revolve said spool, said first drive shaft having at its one end an annular flange engageable with said one end of said spool body and an extension projection from said annular flange that is receivable in said axial hole in said spool body, said extension of said first drive shaft having a radial recess disposed in registry with said radial opening in said spool body; and

(c) holding means associated with said first drive shaft and cooperative with said radial opening with said spool body for holding a leading end of the flexible elongate material on said spool body, said holding means including an axial hole in said first drive shaft communicating at its one end with said radial recess, said holding means further comprising an auxiliary drive shaft rotatably received in said axial hole and said first drive shaft, at least one locking needle operatively connected with said auxiliary drive shaft and selectively projectable beyond an outer peripheral surface of said annular peripheral wall, through said radial recess in said extension and through said radial opening in said spool body, and a presser pad disposed in registry with said radial opening of said spool body and reciprocably movable toward said spool body to force the leading end of the elongate material into locking engagement with said locking needle when the latter projects beyond said outer peripheral surface of said annular wall.

4,840,323

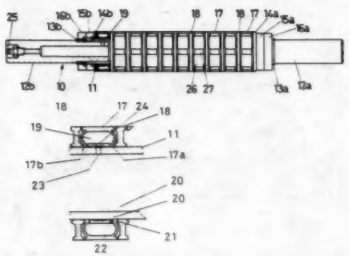
WEB WINDING AND/OR REWINDING SHAFT STRUCTURE

Kiyoji Nakajima, 6-1, Chuo-cho 3-chome, Higashi-Kurume, Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,425

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—72 B **2 Claims**



1. An expansible mandrel for supporting a winding roll comprising:

a center shaft having a longitudinal air passage therethrough;

a plurality of apertures in said center shaft communicating said air passage with the outer periphery of said center shaft;

an air valve means attached to said air passage for connecting to an air source for supplying air to said air passage and to said plurality of apertures;

a plurality of separate hollow expandable annular members mounted along said center shaft, each one of said plurality of expansible annular members having an air inlet for communicating with one of said plurality of apertures for receiving air supplied by said air passage for expanding each one of said plurality of separate hollow expansible members;

a plurality of spacer rings mounted along said center shaft, each one of said plurality of spacer rings being mounted directly adjacent to and separating adjacent ones of said plurality of expansible annular members, and each one of said plurality of spacer rings having means for fixedly attaching directly adjacent ones of said expansible annular members to said outer periphery of said center shaft;

a plurality of internal rings, each one of said plurality of internal rings being mounted inside one of said plurality of expansible annular members, and each one of said internal rings having clamping means for fixedly attaching each said one of said plurality of annular members to said outer periphery of said center shaft; and

wherein, when said plurality of separate hollow expansible annular members is not expanded a winding roll may be slipped over said plurality of annular members and over

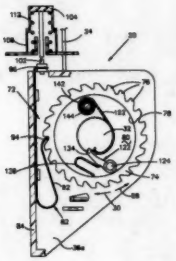
said plurality of spacer rings, and when said plurality of annular members is then expanded sufficiently for contacting the winding roll by an air source attached to said air passage supplying air thereto a winding roll is rigidly attached to said center shaft by the said plurality of expanded annular members.

4,840,324

SEAT BELT RETRACTOR HAVING A COMFORT MECHANISM WITH FULL MEMORY AND SLACK SET

Wallace C. Higbee, Romeo, and Barney J. Bauer, Grosse Pointe Woods, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Dec. 28, 1987, Ser. No. 138,838
Int. Cl.[4] B60R *22/34*
U.S. Cl. 242—107.6 **20 Claims**



20. An apparatus for use in protecting an occupant of a vehicle and comprising:

a spindle having belt webbing wound thereon, said spindle being supported for rotation in belt retraction and belt withdrawal directions;

spring means for biasing said spindle to rotate in the belt retraction direction;

a manually movable member having a portion for engagement by the hand of the vehicle occupant and to which a force is applied by the occupant to move said manually movable member; and

means for rotating said spindle in the belt withdrawal direction to pay out a predetermined amount of belt webbing from said spindle in response to movement of said manually movable member by the vehicle occupant engaging said portion and applying a force thereto and for thereafter blocking rotation of said spindle in the belt retraction direction.

4,840,325

SEAT BELT TIGHTENING DEVICE

Kazuo Higuchi; Hiroshi Tabata; Hisakazu Okuhara; Hidetoshi Saruwatari, and Akihiko Akiyama, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 30,630
Claims priority, application Japan, Apr. 2, 1986, 61-76043; Apr. 2, 1986, 61-49160[U]
Int. Cl.[4] B60R *22/42, 22/46*
U.S. Cl. 242—107.2 **10 Claims**

1. A seat belt tightening device for removing slack in a seat belt when the seat belt is required to positively restrain a passenger, comprising:

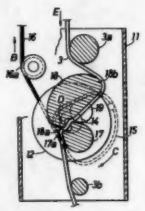
a drive source which is activated when the seat belt is required to restrain the passenger;

a rotary member which is adapted to be rotated about a first axis by said drive source;

a pair of clamp members accommodating a certain span of the seat belt therebetween without substantially obstructing lengthwise motion of the seat belt, means for fixing one of said clamp members with respect to said rotary member, means for rotatably supporting at least one of the clamp members for rotation with respect to said fixed clamp member about a second axis substantially parallel to an apart from said first axis; and

a pair of seat belt guides which are provided at either end of the given span of the seat belt for limiting the motion of the seat belt in a direction perpendicular to a major surface of the seat belt, said guides defining a direct path therebetween;

wherein the rotatable clamp member is provided with a



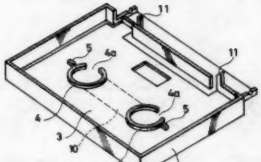
contact surface which pushes a major surface of the seat belt out of line from said direct path between the pair of seat belt guides in response to the rotary member being rotated by the drive source and said rotatable clamp member further includes a clamp surface which clamps the seat belt in cooperation with a corresponding clamp surface of said fixed clamp member as the contact surface pushes the seat belt and said rotatable clamp member is thereby rotatively driven with respect to said fixed clamp member by a reaction which the rotatable clamp member receives from the seat belt.

4,840,326

MAGNETIC TAPE CASSETTE

Shingo Katagiri; Keiji Mori, and Masahiko Asai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1988, Ser. No. 143,475
Claims priority, application Japan, Jan. 13, 1987, 62-2484[U]
Int. Cl.[4] G11B *23/04*
U.S. Cl. 242—199 **6 Claims**



1. A magnetic tape cassette comprising: upper and lower half bodies connected together to define a cassette housing; a pair of flangeless hubs rotatably mounted between said upper and lower half bodies; an annular projection for each of said hubs provided on at least one of said upper and lower half bodies; and a rib for each of said hubs having a height substantially the same height as a corresponding annular projection and extending radially of said corresponding annular projection for only a distance corresponding to a first-wound portion of a tape wound on said corresponding hub.

4,840,327

APPARATUS FOR MEASURING DRAG-FORCE OF FISHING REEL

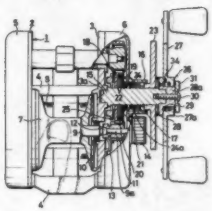
Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,919

Claims priority, application Japan, Sep. 18, 1986, 61-220780

Int. Cl.[4] A01K *89/00*

U.S. Cl. 242—217 **11 Claims**



1. A fishing reel comprising a casing, a spool shaft, a spool carried on said spool shaft, a fishing line wound about said spool, means rotatably maintaining said spool shaft in said casing, a handle shaft having inner and outer portions, a bearing rotatably supporting the inner portion whereby the outer portion is located outwardly of said casing, a handle, means mounting said handle on said handle shaft on the outer portion for relative rotatable motion with respect thereto, a drag-force adjusting knob rotatable on said handle shaft, a drive gear disposed on said handle shaft, a drag device mounted on said handle shaft inwardly of said handle for preselected pressure-setting by rotation of said adjusting knob, said drag device frictionally connecting said drive gear to said handle shaft and interconnecting said drive gear and said adjusting knob and comprising an assembly of laminated washers interengaging said drive gear and said handle shaft and spring means disposed between said drag-force adjusting knob and said washers, whereby said washers are pressurized commensurate with the pressure applied on said spring means by operation of said adjusting knob for effecting the frictional connection of said drive gear to handle shaft, means operatively connecting said handle shaft and said spool shaft for transmitting torque from said handle shaft proportional to the pressure force on the washers to said spool shaft, said torque transmitting means comprising a pinion gear mounted on said spool shaft and engageable with said drive gear, a drag-force measuring mechanism fixed on said handle for applying on said handle a torque slightly greater than the torque applied by said drive gear on said handle shaft, and cooperative visual drag-force display means provided on said drag-force measuring mechanism and said handle.

4,840,328

METHOD AND ARRANGEMENT FOR THE AUTONOMOUS DETERMINATION OF AN INERTIAL POSITIONAL REFERENCE ON BOARD A GUIDED PROJECTILE

Peter Sundermeyer, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

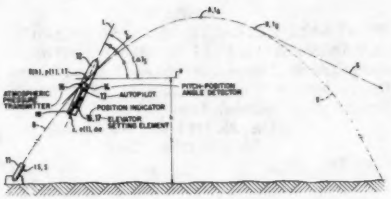
Filed Feb. 19, 1988, Ser. No. 157,890

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707159

Int. Cl.[4] F41G *7/00*

U.S. Cl. 244—3.15 **6 Claims**

1. A method for the autonomous determination of an inertial positional reference on board a guided projectile through the obtention and evaluation of pressure values in the surroundings of the projectile during the movement thereof along a ballistic trajectory; comprising measuring the dynamic atmospheric pressure of the medium of the surroundings onflowing against the projectile during an aerodynamically stable condition of flight of the projectile; and with the value of the atmospheric pressure measurement as a characteristics curve parameter for the momentarily given position of an elevator or stabilizer of the projectile, reading out the momentary absolute pitch position angle of the projectile from an area of characteristics



curves, which has as the content thereof the pitch position angle in dependence upon the position of the elevator in conformance with aerodynamic trim equations for the assumed condition of flight as determined from model observations or model investigations.

4,840,329

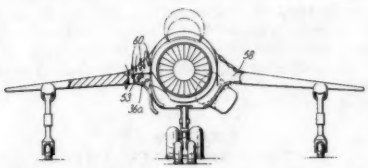
AIRCRAFT WITH STOWABLE VECTORABLE NOZZLE AND EJECTOR THRUST AUGMENTATION

Gary F. Szuminski, Cincinnati, Ohio, and Benjamin D. Ward, Marietta, Ga., assignors to Rolls-Royce Inc., Greenwich, Conn.

Continuation of Ser. No. 934,854, Nov. 25, 1986, abandoned, Continuation-in-part of Ser. No. 849,492, Apr. 8, 1986, Pat. No. 4,713,935. This application Dec. 14, 1987, Ser. No. 134,602

Int. Cl.[4] B64D *33/04*

U.S. Cl. 244—12.5 **17 Claims**

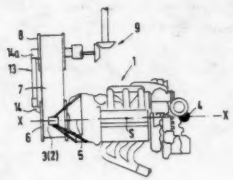


1. An aircraft comprising: structure including a fuselage and wings, a gas turbine engine located in the fuselage, a stowable exhaust nozzle mounted in a bearing and protruding from the bearing through a cut-out section of the fuselage for rotation from a first position in which exhaust gas issuing from the nozzle is directed generally downwards to a second position in which exhaust gas is directed generally rearward; the structure including means defining a stowage cavity situated adjacent the stowable nozzle bearing, the cavity having a generally downward facing outlet opening and being arranged in relation to a nozzle axis of rotation so that the nozzle may be stowed in the cavity in the first position and, in the second position, may be rotated out of the cavity, wherein the nozzle is provided with a cuff fairing attached to the nozzle for rotation therewith, the fairing extending out from the nozzle to blank off at least partially the cut-out section of the fuselage.

4,840,330
SUSPENSION SYSTEM FOR A DRIVE ASSEMBLY OF A HELICOPTER

Ulrich von Broock, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,122
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706379
Int. Cl.[4] B64C 27/00
U.S. Cl. 244—17.27 12 Claims

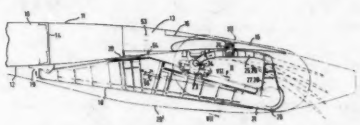


1. A suspension system having elastic bearings for a drive assembly of a helicopter having a belt drive that is arranged between an engine output shaft and a main rotor and comprises a first drum connected with the output shaft and a second drum connected with an angular drive, said drums being connected in a tensionable belt drive, wherein the suspension system has at least two bearing means in the area of the belt drums and another bearing means at the end of the drive assembly that faces away from the belt drums, and wherein said bearing means have a spring rigidity coordination in horizontal and vertical directions for providing limited swivel movements of the assembly around the longitudinal axes of the belt drums as well as parallel lifting movements in the vertical direction.

4,840,331
TRAILING EDGE FLAPS FOR AIRCRAFT WINGS

George H. Williams, Almondsbury, United Kingdom, assignor to British Aerospace PLC, London, United Kingdom

Filed Aug. 9, 1988, Ser. No. 230,018
Claims priority, application United Kingdom, Aug. 11, 1987, 8718977
Int. Cl.[4] B64C 3/50
U.S. Cl. 244—212 4 Claims

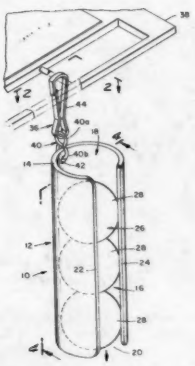


1. A trailing edge flap assembly for an aircraft wing, said wing including at its rearward end upper and lower surfaces terminating in a trailing edge portion, said trailing edge flap assembly comprising a flap member located in a stowed position during normal flight within said trailing edge portion, a mounting beam located to said wing lower surface and extending rearwardly thereof and below said flap member, substantially longitudinal guideway means on said mounting beam, carriage means in rolling engagement with said guideway means, and flap actuation means located at or about the rearward extremity of said mounting beam the improvement consisting in that said flap actuation means comprises actuator mounting means, a rotary actuator and at least one lever arm associated with said rotary actuator about a common substantially transverse axis of rotation, said at least one lever arm extending upwardly and terminating adjacent the undersurface of said flap member in a pivotal attachment to at least one forwardly extending actuator link pivotally interconnecting said at least one lever arm and said carriage means, said flap member being supported upon said flap assembly by means of first link means interconnecting said carriage means to a forward portion of said flap member and second link means interconnecting said at least one actuator link to a more rearward portion of said flap member.

4,840,332
GOLF BALL HOLDER

David D. Hoyt, 4170 Motor Ave., Culver City, Calif. 90230

Filed Aug. 26, 1987, Ser. No. 89,537
Int. Cl.[4] B60R 9/00
U.S. Cl. 224—274 3 Claims



1. A device adapted to be oriented in a vertical position for holding three golf balls aligned in a row, comprising

a wall element made of a resilient plastic material,

said wall element having edges and being formed into a tubular member with the cross section of the wall being partially circular in configuration with said edges being opposed and parallel with each other and spaced apart a distance ranging between 0.500 and 1.000 inch to define an aperture, said distance being sufficient to allow a user to insert a finger into the aperture but sufficiently restrictive to prevent a golf ball from being inserted into the tubular member through said aperture, and the resiliency of the wall element being sufficient to grip a golf ball placed within the tubular member from an end thereof but insufficient to allow the wall element to expand so that the distance between said edges exceeds 1.000 inches.

said tubular member having opposed open ends having an inside diameter prior to inserting a golf ball ranging between 1.500 and 1.750 inch, said diameter being less than the diameter of the golf balls yet sufficiently great to allow a golf ball to be inserted into an open end, with the wall element expanding outwardly as the golf ball enters the tubular member, said wall element gripping the ball firmly upon insertion into the tubular member, and

a stop member adjacent one of said open ends and projecting from the wall element into the interior of the tubular member a sufficient distance to prevent a golf ball from moving through said open end unless the user intentionally applies pressure to the golf ball to force it past the stop member.

4,840,333

DEVICE FOR FASTENING BAR-LIKE OBJECTS

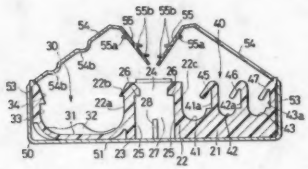
Hiromichi Nakayama, Toyota, Japan, assignor to Nifco, Inc., Yokohama, Japan

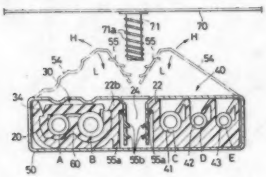
Filed Sep. 15, 1988, Ser. No. 244,764

Claims priority, application Japan, Sep. 21, 1987, 62-144703[U]

Int. Cl.[4] F16L 3/22

U.S. Cl. 248—68.1 20 Claims





1. A device for fastening bar-like objects upon a mounting surface having a stud projecting from said mounting surface, comprising:

a body comprising a one-piece molding, having a holding section for holding a bar-like object and a stud insertion hole extending in a direction substantially perpendicular to the longitudinal direction of the bar-like object fastened thereto, and having a locking shoulder portion defined upon an inner wall surface of said stud insertion hole; and

a belt-like holding sheet disposed around said body and having at least one portion thereof capable of being inserted through said stud insertion hole along said inner wall surface thereof, said at least one end portion being provided with a first locking pawl extending toward said inner wall surface of said stud insertion hole and capable of being locked to said locking shoulder portion of said stud insertion hole, and a second locking pawl extending toward the center of said stud insertion hole for engagement with a threaded portion of said stud to be inserted within said stud insertion hole so as to prevent detachment of said device from said stud.

4,840,334

FASTENER FOR FASTENING ELONGATE OBJECT

Akio Kikuchi, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Feb. 17, 1988, Ser. No. 156,630

Claims priority, application Japan, Feb. 17, 1987, 62-21741[U]

Int. Cl.[4] F16L 3/08

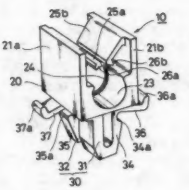
U.S. Cl. 248—73 14 Claims

1. A plastic one-piece molded fastener for mounting an elongated object upon a support panel having an aperture defined therein for reception of a portion of said fastener, comprising:

means for holding said elongated object, having a longitudinal axis defined therein, such that said longitudinal axis of said elongated object extends in a predetermined axial direction with respect to said holding means so as to define an axial plane within said fastener;

first, substantially U-shaped leg means having a first leg portion thereof having one end fixedly secured to an undersurface portion of said holding means which is disposed upon a first side of said axial plane of said fastener, and a second leg portion thereof, cantilevered from the other end of said first leg portion so as to be resiliently flexible with respect to said first leg portion thereof and thereby permit entrance of said first substantially U-shaped leg means into said aperture defined within said support panel, having means thereon for engaging undersurface and upper surface portions of said support panel when said first substantially U-shaped leg means of said fastener is disposed within said aperture defined within said support panel, said second leg portion of said first substantially U-shaped leg means being disposed upon a second opposite side of said axial plane of said fastener such that a hollow portion of said first substantially U-shaped leg means as defined between said first and second leg portions thereof is disposed substantially within said axial plane of said fastener; and

second, substantially U-shaped leg means having a first leg portion thereof having one end fixedly secured to an



undersurface portion of said holding means which is disposed upon said second opposite side of said axial plane of said fastener, and a second leg portion thereof, elastically fixed to said first leg portion thereof so as to be resiliently flexible with respect to said first leg portion thereof and thereby permit entrance of said second substantially U-shaped leg means into said aperture defined within said support panel, having means thereon for engaging undersurface and upper surface portions of said support panel when said second substantially U-shaped leg means of said fastener is disposed within said aperture defined within said support panel, said second leg portion of said second subtantially U-shaped leg means being disposed upon said first side of said axial plane of said fastener such that a hollow portion of said second substantially U-shaped leg means as defined between said first and second leg portions thereof is disposed substantially within said axial plane of said fastener whereby said hollow portions of said first and second substantially U-shaped leg means, and said first and second substantially U-shaped leg means, are substantially co-axially disposed with respect to each other along said axial plane of said fastener.

4,840,335

HOLDING ARRANGEMENT FOR LOADING PLASTIC BAGS

Edward W. Forman, Jr., Palmyra; Alexander R. Provan, Canandaigua, and Ronald R. Schmieder, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 19, 1985, Ser. No. 713,432

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.[4] B65B 67/04

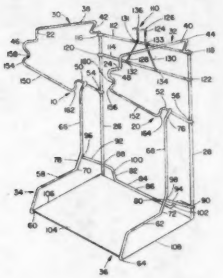
U.S. Cl. 248—97 11 Claims

1. A bag holding arrangement adapted to facilitate the loading of articles into a plastic bag selectively removable from stacks of differently sized bags, each said bag having an upwardly opening mouth and a pair of integral upwardly extend-

ing handle loops disposed on opposite sides of said mouth, said holding arrangement comprising:

a pair of spaced side members having a mirror-image configuration, each said side member being formed of wire bent to form a vertical rear portion, an arm portion extending forwardly from the upper end of said rear portion, and a base portion extending forwardly from the lower end of said rear portion;

said arm portion including a first upwardly extending horizontally elongated tab having a rearwardly projecting protrusion, a forwardly extending nose segment, and a downwardly and rearwardly extending wire portion having the forward end thereof connected to said nose segment and the rearward end thereof fastened to said vertical rear portion, a second downwardly depending elongated tab formed in said wire portion having a forwardly projecting protrusion and a bag-engaging surface at the rearward end of the tab;



holding means interconnecting said vertical rear portions proximate the upper ends thereof for supporting a stack of bags of a predetermined size therefrom; and

means interconnecting each of the forward extending base portions to provide a horizontal support surface,

whereby a user is adapted to selectively place the handle loops of the topmost bag from a stack of a predetermined bag size, which when the bag is of a larger size, on a respective one of the first upwardly tabs, or alternatively when the bag is of a smaller shorter size, place the handle loops of the bag on respectively one of the downwardly depending second tabs, such that the bottom of the bag is supportable on said horizontal support surface.

4,840,336

CANTILEVERED SUPPORT ARMS FOR PLASTIC BAG RACK

Alvin L. Stroh, Downey, and Terry C. Pilon, Claremont, both of Calif., assignors to McMillin Wire & Plating, Inc., Los Angeles and Challenge Bag California, Inc., Rancho Cucamonga, both of, Calif.

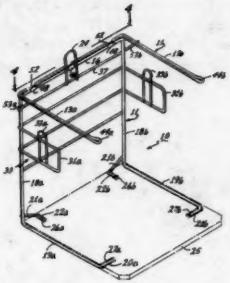
Filed Jun. 6, 1988, Ser. No. 202,329
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—97 **8 Claims**

8. Apparatus, formed of a single length of wire having a middle portion and end portions with terminal ends, for use in suspending plastic bags on a rack, said apparatus comprising:

a structure comprised of upper and lower wire portions provided by bending each end portion of said single length of wire beneath its middle portion;

said structure including a middle back portion and a support arm portion with a free end cantilevered forwardly from each end of said middle back portion; and

each said cantilevered support arm portion having a protuberance on the free end thereof provided by the bending of the end portion of the single length of wire beneath its middle portion and having its upper wire portion positioned adjacent its lower wire portion.

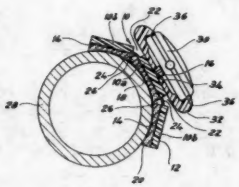


4,840,337

SUPPORT FORMED OF RIGID PLASTIC MATERIAL

Hans Zaugg, Derendingen, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

Filed May 6, 1988, Ser. No. 190,845
Claims priority, application Switzerland, May 8, 1987, 01769/87
Int. Cl.[4] A47F *7/02*
U.S. Cl. 248—115 **20 Claims**



1. A support comprising:

a pellet of rigid plastic material having two opposed faces and comprising a rigid central portion and a pair of rigid outer portions, each of said rigid outer portions being connected to said rigid central portion by a flexible bridge formed by at least one elongated groove in said pellet;

a coupling means on one of said opposing faces; and,

a layer of adhesive material on the other of said opposing faces, a part of said adhesive layer being on each of said rigid outer portions, and said flexible bridge permitting each of said rigid outer portions to be adhered to a planar surface when said rigid outer portions are aligned with said rigid central portion and to be adhered to a non-planar surface when said rigid outer portions are folded back relative to said rigid central portion such that said coupling means can be fastened to a corresponding one of said surfaces.

4,840,338

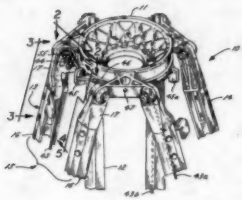
LOCKING TRIPOD LEG

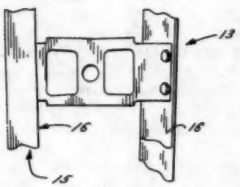
Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

Filed Sep. 28, 1987, Ser. No. 101,504
Int. Cl.[4] F16M *11/32*
U.S. Cl. 248—168 **6 Claims**

2. A tripod comprising, in combination, a tripod head, three elongated leg assemblies secured at their upper ends to said

head, each of said leg assemblies having upper portions rigid in a plane, said planes forming a triangle at said head and being at approximately 120° angles from the adjacent planes, each leg assembly having a lower portion slidably mounted in the upper portion for selectively extending the length of the leg assemblies, means in each leg assembly for clamping the lower portion to the upper portion to prevent relative movement in the





plane of that leg assembly, means in each leg assembly for locking the lower portion against sliding movement in the upper portion, and means on said head for releasing both the clamping means and the locking means of each leg assembly, said means for releasing permitting operation of the locking and clamping means of each leg assembly either simultaneously or each leg assembly individually.

4,840,339

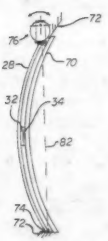
BISTABLE PANEL ATTACHMENT SYSTEM

Larry N. Grogan, Manchester, N.H., assignor to Velcro Industries B.V., Amsterdam, Netherlands

Filed Jan. 27, 1988, Ser. No. 148,932

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—205.2 **16 Claims**



1. A fastener system for mounting a structure to a support by means of a fastener having a first part, associated with said structure, carrying a large plurality of projecting elements capable of engaging cooperating elements carried by a second part of the fastener, associated with said support, to fasten the structure and support together, comprising:

(a) a resilient member having one of the first and second parts of the fastener attached to a surface thereof at least adjacent a center portion thereof;

(b) restraining means, connected to said support, defining the length of a chord of a curvature of said member to form a curved resilient spring able to move from a first stable arched position to a second stable inverted arched position, the elements of said first part, when engaging with the elements of said second part, resiliently fastening said structure and support together by means of a force provided by the engagement of the elements of the fastener parts and the resilience of the resilient members; and

(c) adjustable means associated with said restraining means for adjusting the chord length of said curved resilient spring, when desired, to facilitate movement from one to the other of the two stable positions.

4,840,340

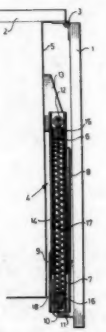
TELESCOPIC BRACE ASSEMBLY

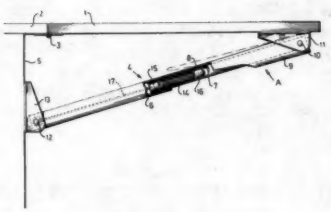
Hans Gustafsson, Västerås, and Thomas Hallberg, Köping, both of Sweden, assignors to GH Trading AB, Västerås, Sweden

Filed Apr. 1, 1988, Ser. No. 176,509

Int. Cl.[4] A47B *1/04*

U.S. Cl. 248—240.4 **7 Claims**





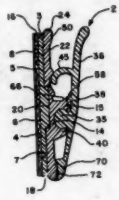
1. A telescopic brace assembly **(4)** for use with two objects **(1, 2)** which are capable of being folded relative to one another and particularly intended for supporting a work surface **(1)** which can be folded relative to a frame structure **(5)**, said brace assembly including two tubes **(6, 7)** which are capable of being telescopically displaced one within the other and the mutually opposite free ends of which are intended to be pivotally connected **(10, 12)** to a respective one of said objects, a spring **(14)** arranged in the telescopic tubes for biasing the tubes together; and locking means **(8)** for releasably locking the telescopic tubes relative to one another in an active supporting position of the brace assembly, said spring comprising a compression spring disposed such that when the telescopic tubes are withdrawn one from the other the spring is compressed to attendantly store energy therein; the extent to which the telescopic tubes can be withdrawn one from the other being determined

by a maximum degree of compression of the spring, wherein one end of the spring co-acts with a stop means (15) which is stationary in relation to one of said telescopic tubes; the spring is adapted to be compressed against said stop means with the aid of a pull rod (17) which accompanies movements of the other telescopic tube and which is connected (16) to the other end of the spring, wherein the spring is arranged in an inner one (7) of said two telescopic tubes and is compressible against said stop means located at a free end of said inner tube, said pull rod extending through the stop means, one end thereof being located in and firmly held (12) relative to an outer one of said telescopic tubes and another opposite end thereof being connected (16) to an end of the spring distal from the stop means.

4,840,341
CLIP AND HOLDER

Gary K. Hasegawa, 1457 W. Hutchinson Ave., Chicago, Ill. 60613

Filed May 9, 1988, Ser. No. 191,345
Int. Cl.[4] A47F 5/00
U.S. Cl. 248—316.5 16 Claims



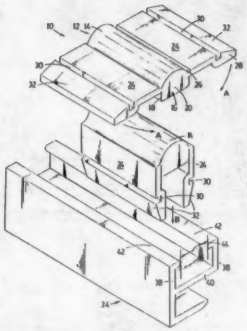
1. A flexible plastic clip assembly comprising:
an elongated support bar,
first and second pivotally interconnected clip members pivotal between closed and open positions for respectively grasping articles and releasing the same,
means interlocking said first slip member to said bar for adjustable movement along the bar lengthwise thereof,
and spring means interposed between said members for biasing said second member to closed position with said first member,
said first member having a flexible portion in the region of said interlocking means and said spring means engaging and operative to deflect said portion of said first member into tight interlocking relation with said bar to hold the clip assembly from moving along the bar.

4,840,342
PICTURE FRAME STANDOFF

Henry D. Sweeny, Kitchener, and Antonio D. Sabbadin, Waterloo, both of Canada, assignors to Swenco Limited, Waterloo, Canada

Filed Jan. 20, 1988, Ser. No. 146,028
Int. Cl.[4] A47G 1/16
U.S. Cl. 248—475.1 3 Claims

1. A standoff for use with a picture frame member presenting a generally C-shaped channel profile toward the rear thereof with a pair of coplanar flanges spaced apart by a narrow gap therebetween, said standoff comprising:
a central, wall-engaging portion which includes a transversely arcuate outer surface, first and second sides and first and second ends, a generally rectangular peripheral skirt therebelow having side and end skirt portions connected to said sides and ends of said central portion, and a central transverse rib extending between and connecting said side skirt portions;
a pair of flexible leg portions each extending away from the wall-engaging portion and connected thereto by a living hinge extending along the adjacent side of the wall-engaging portion at the junction of the outer surface and the adjacent side skirt portion; and
a groove formed in an enlarged section at the free end of each leg portion and extending parallel to the side skirts of the wall-engaging portion; whereby in use the leg portions may be rotated about the living hinges thereof to bring the free ends together with the grooves facing away from

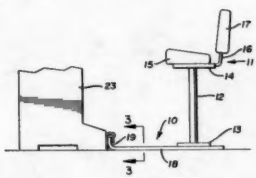


each other such that the free ends may be inserted into the gap between the flanges of the frame member, release of the leg portions allowing them to spring apart so that each groove thereof may engage the adjacent flange to hold the standoff in position, extending rearwardly of the frame member so that said arcuate surface may contact a wall or other surface.

4,840,343
QUICK RELEASE SEAT SUPPORT

George E. Gasser, 4136 Loganway, Youngstown, Ohio 44505

Filed Mar. 3, 1988, Ser. No. 163,744
Int. Cl.[4] A47B 97/00
U.S. Cl. 248—500 3 Claims



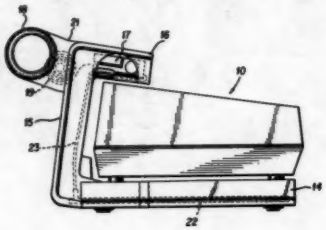
1. A quick release seat support comprising in combination an elongated flat body member, a seat configuration secured to said elongated flat body member, a quick release fitting on said elongated body member comprising a curved portion of said elongated body member having a forshortened free upstanding end thereon at right angles to the plane of said elongated body member, said free upstanding end having parallel planar surfaces, an inverted fixed elongated channel member having an angularly inclined descending portion aligned for compound angular registration of said curved portion of said body member engaging and resiliently displacing the angularly inclined descending portion within, said elongated channel member secured to a machine base.

4,840,344

TERMINAL PROVIDED WITH A PRINTER

Tomomi Moroe, Ohtsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 8, 1987, Ser. No. 59,783
Claims priority, application Japan, Jun. 9, 1986, 61-87741[U]
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—676 7 Claims



1. A terminal support including an integral printer unit comprising:

a printer unit support comprising a base member for receiving a terminal mounted thereon, and a supporting member connected to and extending upwardly from said base member;

a printer unit supported by said supporting member at a location which overlies at least a portion of a terminal mounted on said base member; and

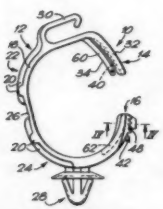
a control circuit board mounted within said printer unit support for controlling said printer unit.

4,840,345

CLIPS WITH OVERLAPPING ENGAGEMENT MEMBERS

Gary A. Neil, Amersham, and Edward H. F. Ferguson, Aylesbury, both of England, assignors to TRW United-Carr Ltd., Buckinghamshire, United Kingdom

Filed Jan. 29, 1988, Ser. No. 149,696
Claims priority, application United Kingdom, Jan. 30, 1987, 8702148
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.2 11 Claims



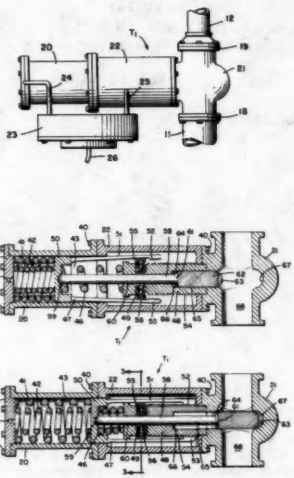
1. A clip comprising a gapped annular body having two end portions defining a gap therebetween, said end portions being adapted to interengage in overlapped relationship to close the body, one of said end portions being bifurcated to provide a forked configuration defining first and second radially spaced and axially offset fork portions and the other end comprising first and second axially adjacent parts, said fork portions being arranged such that, when said end portions are interengaged, said first fork portion radially overlaps substantially only said first part and said second fork portion is radially overlapped by substantially only said second part; and, abutment means extending radially from between said axially adjacent parts to engage axially between said first and second fork portions.

4,840,346

APPARATUS FOR SEALING A WELL BLOWOUT

Dewa N. Adnyana, Stamford, and Neil E. Rogen, Westport, both of Conn., assignors to Memory Metals, Inc., Norwalk, Conn.

Filed Apr. 11, 1985, Ser. No. 721,957
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] E21B *33/06*
U.S. Cl. 251—1.3 24 Claims



1. Apparatus for sealing a well tubing bore comprising:

a housing including channel means for communicating with said tubing bore and a chamber connected to said channel means;

sealing means slidably mounted within said housing and disposable in a retracted open condition in said chamber to enable fluid flow through said channel means; and

actuator means disposed in said chamber and including a shape memory alloy material responsive to the temperature thereof rising to a predetermined level corresponding to the transition temperature of said shape memory alloy for transforming in shape to extend said sealing means into a sealing contact within said channel means thereby blocking fluid flow therethrough; said channel means including a concave portion and said sealing means including a distal end having a complementary convex surface for conformably fitting said concave portion when said sealing means are extended.

2. Apparatus for sealing a well tubing bore comprising:

a housing including channel means for communicating with said tubing bore and a chamber connected to said channel means;

sealing means slidably mounted within said housing and disposable in a retracted open condition in said chamber to enable fluid flow through said channel means;

actuator means disposed in said chamber and including a shape memory alloy material responsive to the temperature thereof rising to a predetermined level corresponding to the transition temperature of said shape memory alloy for transforming in shape to extend said sealing means into a sealing contact within said channel means thereby block-

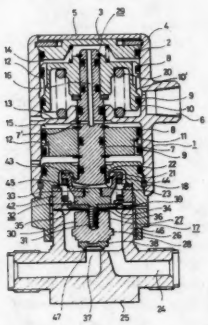
ing fluid flow therethrough; and means for locking including first ratchet means disposed axially in said chamber, complementary second ratchet means opposing said first ratchet means, radially resilient means connecting said second ratchet means to said first side of said slidable connector and urging said second ratchet means to slide over said first ratchet means as said sealing means is extended and lock with said first ratchet means when said actuator means is cooled to resume an untransformed shape.

4,840,347

PNEUMATICALLY-OPERATED VALVE

Ryozo Arizumi; Masakuni Kainuma; Toshikazu Aoki; Shoji Suda; Mitsunori Hoshi, all of Saitama, and Takashi Ejiri, Tokyo, all of Japan, assignors to Fujikura Rubber, Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,092
Int. Cl.[4] F16K *31/122*
U.S. Cl. 251—63.4 **11 Claims**



1. A pneumatically-operated valve for controlling the flow of fluid through a fluid passageway by movement of said valve between a normally open position and a closed position with respect to a valve seat defined upon said fluid passageway, comprising:

valve means, disposed within the vicinity of said fluid passageway and spring-biased to said normally open position, for controlling said flow of fluid through said fluid passageway;

a cylinder having a longitudinal axis defined therein;

a transversely extending annular partition plate disposed within said cylinder for dividing said cylinder into first and second piston chambers;

an axially disposed piston rod movable within said cylinder between first inoperative and second operative positions, and extending through said annular partition plate so as to have opposite end portions thereof disposed within said first and second piston chambers;

first piston means fixedly secured upon one end of said piston rod and disposed within said first piston chamber;

second piston means fixedly secured upon an axially central portion of said piston rod and disposed within said second piston chamber, a second end portion of said piston rod being disposed within the vicinity of said valve means for engaging said valve means and moving said valve means from said normally open position to said closed position when said piston rod is moved from said first inoperative position to said second operative position;

spring biasing means, disposed within said first piston chamber and interposed between said annular partition plate and said first piston means, for normally biasing said piston rod to said first inoperative position;

inlet port means defined within a sidewall portion of said cylinder for introducing pressurized fluid into said first piston chamber in order to move said piston rod from said first inoperative position to said second operative position;

axially extending fluid passageway means defined within an external surface portion of said first piston means for fluidically connecting said inlet port means to said first piston chamber;

axially extending fluid passageway means defined within said piston rod from said one end of said piston rod to said axially central portion of said piston rod for providing fluidic communication from said first piston chamber toward said second piston chamber; and

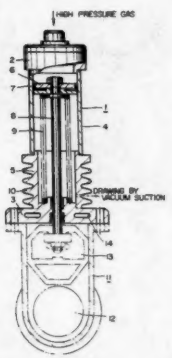
transversely extending fluid passageway means defined within said axially central portion of said piston rod for providing fluidic communication between said axially extending fluid passageway means of said piston rod and said second piston chamber.

4,840,348

VALVE ACTUATOR FOR SLIDE EXHAUST BRAKE SYSTEMS

Kazunori Takigawa, Numazu, and Roichi Suzuki, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Nagasawa, Japan

Continuation of Ser. No. 867,486, May 27, 1986, Pat. No. 4,733,687. This application Nov. 18, 1987, Ser. No. 122,128
Claims priority, application Japan, Jun. 6, 1985, 60-85410
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] F16K *31/122, 49/00*
U.S. Cl. 251—63.6 **8 Claims**



1. A valve actuator for use with a slide exhaust brake system having an exhaust gas passage for carrying hot exhaust gases, said valve actuator comprising: a sealed cylinder casing having a head wall fixed to the upper thereof and a bottom wall fixed to the lower end thereof; a piston member fitted in said cylinder casing and having its piston rod projecting at its end portion to the outside through said bottom wall; a packing member mounted to and surrounding said piston member; and a plate valve member carried on the end portion of said piston rod for opening or closing the exhaust gas passage of said exhaust brake system which is to be fastened to the bottom wall of said cylinder casing, and a coil spring surrounding said piston rod and disposed intermediate said piston member and said bottom wall for urging said plate valve member toward the open position,

wherein the improvement resides: in that said cylinder casing includes a cylinder body formed from a first metal material having a first thermal conductivity, said cylinder body having one end fixed to said head wall and having a length substantially equal to the sliding distance of said piston member fitted therein, and a cylindrical wall

formed from a second metal having a second thermal conductivity which is different from the first thermal conductivity, said cylindrical wall surrounding and being spaced radially from said piston rod and said coil spring and having one end fixed on the inner side of the bottom wall of said cylinder casing and having its opposed end fixed to the end of the cylinder body opposite the head wall, said cylindrical wall having a length substantially equal to the length of the coil spring in a compressed condition corresponding to the closed position of the plate valve, whereby the cylindrical wall substantially spaces said cylinder body, said packing member and said piston member from the hot exhaust gases in the exhaust gas passage and provides said cylinder body with a substantially minimal length, and whereby the different thermal conductivities provide a thermal impulse which reduces heat transfer to said cylinder body for reducing thermal influence on the packing member.

4,840,349

DEVICE FOR ACTUATING A THROTTLE VALVE

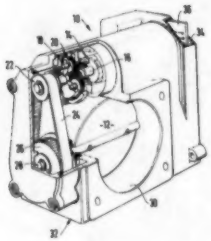
Cornelius Peter, Ottersweiher; Uwe Schaper, Buehl-Vimbuch, and Lothar Schmidt, Buehl-Altschweier, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1988, Ser. No. 271,458

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 8715467[U]

Int. Cl.[4] F16K *31/04*

U.S. Cl. 251—129.11 **3 Claims**



1. A device for actuating a throttle valve, comprising an electric drive motor, a step down gear driven by said electric drive motor, said step-down gear that drives an output shaft, said output shaft is provided with a first gear wheel (22) which is operatively connected to a throttle valve shaft (28), said step-down gear is embodied as a planetary gear (18), said throttle valve shaft (28) is provided with a second gear wheel (26) that is disposed on one end of said throttle valve shaft (28), and said first and second gear wheels (22, 26) are operatively joined to one another by a toothed belt (24).

4,840,350

ELECTRICALLY ACTUATED EGR VALVE

John E. Cook, Chatham, Canada, assignor to Bendix Electronics Limited, Chatham, Canada

Filed Jul. 31, 1987, Ser. No. 80,041

Int. Cl.[4] F16K *31/04, 31/52*

U.S. Cl. 251—129.11 **9 Claims**

1. A valve comprising:

a valve seat, positioned about a passage;

a rigid valve stem that is movable in a substantially axial manner relative to the valve seat, from a first position corresponding to valve seat closure, to a second position corresponding to non-closure of the valve seat;

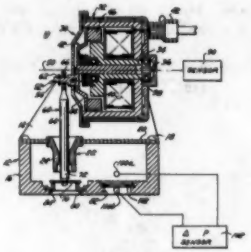
closure means carried by the valve stem for seating upon the valve seat and for opening and closing the passage;

an eccentric that can execute arcuate motion about an axis and comprises, in spaced relation to said axis, a pivotal connection to said stem;

a valve stem guide that is spaced from said valve seat and from the pivotal connection of said eccentric to said stem;

said valve stem guide comprising a convex wall defining a valve stem passage through which said valve stem extends and which is substantially coaxial with said first-mentioned passage, said convex wall providing a constraint on said valve stem passage as the stem is being axially displaced through the valve stem passage;

said eccentric and said convex wall being organized and arranged in relation to said stem such that in response to



arcuate motion of said eccentric about said axis from a first angular orientation, corresponding to said first position, to a second angular orientation, corresponding to said second position, the shaft is displaced substantially axially while pivoting with respect to both the eccentric and the valve stem passage, and for a given amount of motion of said eccentric about said axis from said first angular orientation, the closure means is moved relative to the valve seat a smaller distance than the closure means is moved relative to the valve seat for the same given amount of motion of said eccentric about said axis from said second angular orientation.

4,840,351

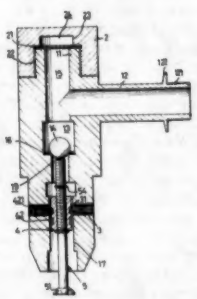
FAUCET STRUCTURE

Jong T. Lii, No. 2, Alley 203, Lane 51, Yung Ta Road, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Apr. 18, 1988, Ser. No. 182,523

Int. Cl.[4] F16K *31/44*

U.S. Cl. 251—230 **2 Claims**



1. A faucet structure comprising:

(a) a hollow housing (1) having a protruding end (11) on a top portion thereof, a tubular means (12) integrally and horizontally formed on an upper lateral surface thereof to threadedly engage with a water pipe, a steel ball (14) to

control a volume of water being encased in an enlarged bore (13) of said housing (1), a pad (16) disposed beneath said steel ball (14) to prevent damage to said steel ball (14) and provide a sealing effect therebetween, a plurality of strips (17) formed in an interior of said housing (1) below said enlarged bore (13), and a threaded hole (18) laterally formed through said housing (1) on a pair of said strips (17) wherein said two strips (17) are oriented opposite to each other;

(b) a cap (2) threadedly provided on said housing (1) with a circular gasket (21) disposed therebetween;

(c) a plurality of plugs (3) which are threadedly received in respective threaded holes (18), said plugs (30) each having a tongue (31) horizontally formed on a distal end thereof to protrude from a surface of said strip (17);

(d) a valve body (4) having a threaded hole (41) axially extending through a central part thereof, and two mortises (42) which are respectively disposed on opposite exterior sides thereof for receiving said tongues (31); and,

(e) a stem (5) with a threaded surface on an upper part thereof being threaded through said valve body (4), a retaining ring (52) and C-ring (54) being provided on an exterior of said stem (5) to cooperatively define a range that said valve body (4) is threadedly urgeable on said stem (5) by turning an irregularly-formed end (51) which is mounted on a bottom end of said stem (5).

4,840,352

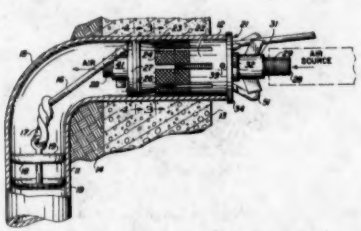
BLOW PLUG

Roy J. Ellis, 430 E. Cascada Rd., Litchfield Park, Ariz. 85340

Filed Feb. 1, 1988, Ser. No. 150,780

Int. Cl.[4] B65H *59/00*

U.S. Cl. 254—134.4 **10 Claims**



1. A conduit plug comprising a cylindrical split sleeve, a wedge having a narrow end and a wide end, said wedge being adapted to be moved into said sleeve to expand the sleeve into contact with the inner surface of the conduit, a resilient sealing member positioned at the wide end of said wedge and having a cylindrical periphery, a compression member overlying said sealing member, means for applying a force to said compression member to move said wedge into said sleeve and to compress the sealing member to cause the periphery of said sealing member to expand into sealing engagement with the inner surface of the conduit, means providing an air passage through the conduit plug and means providing a lead line passage through the conduit plug.

4,840,353

APPARATUS FOR STUDYING QUENCHING FLUIDS AND QUENCHABILITY OF MATERIALS

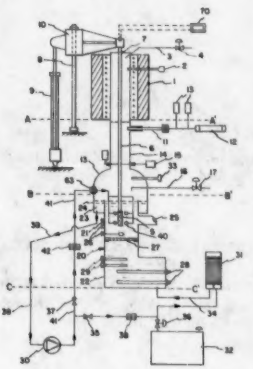
Patrice Schwegler, Bavans; Jean-Jacques Debrie, Merous-Moval; Bernard Clement, Evette Slabert; Francois Moreaux, Nancy, and Jacques Olivier, Jouars-Pontchartrain, all of France, assignors to Servimetal, Paris, France

Filed Sep. 9, 1987, Ser. No. 94,426

Claims priority, application France, Sep. 11, 1986, 86 12895

Int. Cl.[4] C21D *11/00*

U.S. Cl. 266—80 **19 Claims**



1. Apparatus for studying quenching fluids and the stirring thereof and quenchability of materials in the form of testpieces (5), comprising in combination: a furnace (1) for heating said testpieces, means for introducing each testpiece into the quenching liquid and extracting the quenched testpiece, a quenching tank (20) containing the quenching fluid, and means for circulating the quenching fluid by a pump and associated conduits, wherein the quenching tank (20) comprises an upper tank (21) and a lower tank (22) which are connected by means (27) for organising the circulation and distribution of the fluid and establishing the speed thereof, the upper tank being provided with an immersed injector (40) formed by at least one circular array comprising a plurality of radial nozzles (62) directed towards the axis of the tank and connected to a pressurised fluid source (30), the upper portion of the upper tank comprising a conduit (39) for the return of fluid to the pressurisation means (30), the lower tank (22) comprising a separate pressurised fluid intake, means for monitoring and regulating the temperature of the fluid, and means for measuring the speed of circulation of the fluid.

4,840,354

STIRRING BRICK WITH SHAPED GAS VOLUME CONTROL OPENINGS

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

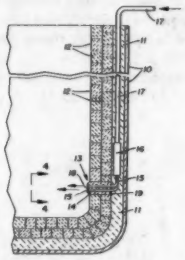
Filed Jun. 22, 1988, Ser. No. 209,834

Int. Cl.[4] C21C *5/48*

U.S. Cl. 266—218 **8 Claims**

1. An improvement in apparatus for introducing gas into molten metal in a metallurgical vessel having a plurality of rectangular refractory bricks forming a protective refractory working lining on the bottom and side walls thereof, said improvement comprising a stirring block consisting of a refractory body member having horizontally disposed upper and lower surfaces and vertically disposed front, back, and end surfaces positioned in a side wall of said protective refractory working lining with said upper, lower, and end surfaces thereof in face to face engagement with said rectangular refractory bricks so as to form an unbroken continuation of the

refractory working lining, a plurality of transverse passageways in said stirring block communicating with said front



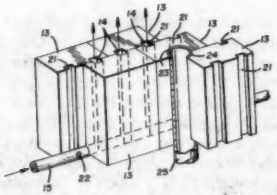
surface thereof and means establishing communication with said passageways and a source of stirring gas.

4,840,355

SLAG CONTROLLING DEVICE FOR BASIC OXYGEN FURNACES

Micheal D. LaBate, 116 Hazen Ave., Ellwood City, Pa. 16117

Filed Jul. 13, 1988, Ser. No. 218,305
Int. Cl.[4] B22D *41/08*
U.S. Cl. 266—220 **6 Claims**



1. An improvement in a metallurgical vessel having a refractory lining and a tap hole, the improvement comprising: a plurality of refractory bodies having planar upper and lower and side surfaces, channels in said side surfaces of some of said refractory bodies positioned for registry with channels in the side surfaces of others of said refractory bodies when said refractory bodies are positioned around said tap hole so as to form a portion of said refractory lining, some of said registering channels defining gas passageways and others of said registering channels defining an opening communicating with said tap hole and means communicating with a source of gas and said channels defining said gas passageways for delivering and controlling the gas delivered to said gas passageways.

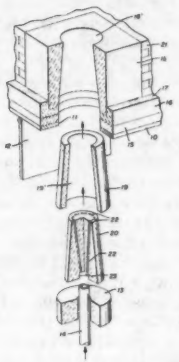
4,840,356

EXTERNALLY REPLACEABLE STIRRING PLUG FOR MOLTEN METAL VESSELS

Michael D. Labate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jun. 13, 1988, Ser. No. 205,821
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—265 **7 Claims**

1. In a device for introducing gas into a mass of molten metal in a vessel having a refractory lining and an apertured block of a known height having horizontally disposed upper and lower surfaces and vertically disposed side surfaces positioned in said lining with said aperture in registry with an opening in said vessel, the improvement comprising a refractory core of the same height as said apertured block registable with said aperture in said block, passageways formed in and extending through said refractory core, said refractory core and said opening in said vessel being of substantially the same size so that said refractory core may be moved through said opening in said vessel into said aperture in said block, means for deliver-



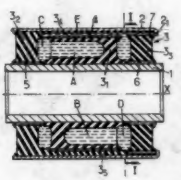
ing gas to said passageways in said core and means for supporting said core in said block , said means for supporting said core in said block consisting of a spacer and a support plate therefor, said support plate being removably attached to said vessel.

4,840,357

HYDRAULIC ANTIVIBRATORY SUPPORT SLEEVES

Pierre Jouade, Chateaudun, France, assignor to Hutchinson, France

Filed Jun. 16, 1988, Ser. No. 207,517
Claims priority, application France, Jun. 19, 1987, 87 08615
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—140.1 **5 Claims**

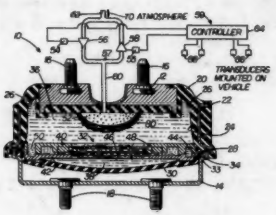


1. A hydraulic antivibratory support sleeve comprising two rigid tubular frames (1,2) one surrounding the other and joined together by an elastomer body (3) adhered thereto and shaped so as to form therewith at least two diametrically opposite sealed pockets (A,B), communicating together through a narrow channel (E), the assembly formed by said pockets and said narrow channel being filled with a damping liquid (L), the pockets being in the form of cavities formed axially in at least one solid annulus forming the elastomer body, which cavities have a relatively small radial thickness so as to be substantially closed by radial crushing, characterized in that the pockets (A,B) open respectively into two separate at least semi-annular chambers (C,D) formed in the elastomer body and in that these two chambers are joined together exclusively by the above narrow channel (E), said channel being oriented in a direction having at least an axial component.

4,840,358
HYDRAULIC ENGINE MOUNT WITH AIR BLADDER TUNING

John F. Hoying, Bellbrook, Ohio, and Bernard Lange, Russelsheim, Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1988, Ser. No. 173,848
Int. Cl.[4] F16F 9/50
U.S. Cl. 267—140.1 3 Claims

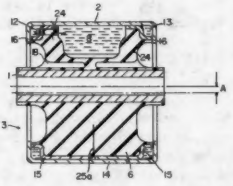


1. A hydraulic mount assembly, comprising:
a pair of mounting members;
a hollow body connected to said mounting members;
a resilient diaphragm closing said hollow body and forming therewith a closed cavity that is filled with hydraulic fluid;
means for partitioning said cavity into a primary chamber and a secondary chamber enclosed by said diaphragm;
an expandable pneumatic bladder mounted within said primary chamber;
communication means for communicating said bladder solely with the atmosphere, and;
check valve means mounted within said communication means to control the flow of air between said bladder and the atmosphere;
whereby the bladder is passively inflated and deflated by operation of the mount assembly itself and the damping and dynamic rate characteristics of the hydraulic mount may be controlled by said check valve means to provide optimum vehicle operating characteristics.

4,840,359
ENCAPSULATED RUBBER CUSHION

Arno Hamaekers, Gorxheimertal, and Axel Rudolph, Darmstadt, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Apr. 14, 1988, Ser. No. 181,558
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724432
Int. Cl.[4] F16F 13/00
U.S. Cl. 267—140.1 15 Claims

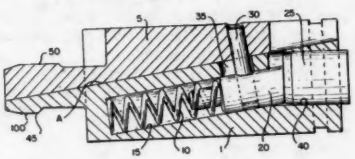


1. An encapsulated rubber cushion having a longitudinal axis and adapted to be stressed chiefly perpendicular to its axis, comprising:
two sleeves one around the other in an axially parallel relationship and a resilient body of rubber disposed between them which contacts the outer of the sleeves with at least two webs projecting substantially in the radial direction, the webs being associated with an imaginary perpendicular plane erected in the axis of the sleeves and together with terminal end walls and the outer of the sleeves defining at least partially liquid-filled chambers which are connected at least partially by connecting openings, the webs being compressed together resiliently between the two sleeves to a breadth that is smaller than the breadth in which they were manufactured, and the webs being compressed in the axial direction to a length that is shorter than the length in which they were manufactured, and the webs being produced in the form of pairs of partial webs which have an axial distance from one another which increases radially outwardly, and the distance being substantially eliminated in the assembled encapsulated rubber cushion by a pressing against one another of the pairs of partial webs.

4,840,360
EXPANDING MANDREL

Donald L. Bartley, Willoughby, Ohio, assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 20, 1988, Ser. No. 183,943
Int. Cl.[4] B21D 41/02
U.S. Cl. 269—48.1 18 Claims



1. An expanding mandrel for operation within a cylindrical sleeve comprising:
(a) a body member having a concave inner surface and having a working end which engages an inner diameter of a workpiece at a single point;
(b) resilient means mounted within the body member;
(c) a single wedge member slidably engaging the body member concave inner surface having a working end which engages the inner diameter of the workpiece at two points, the wedge engaging and being biased by the resilient means in a direction opposite the working end of the body member;
(d) shaft means for compressing the resilient means and sliding the wedge towards the working end of the body member;
wherein the wedge and body member are forced against the inner diameter of the workpiece by the resilient means, forming a three point contact, and are released by the application of external pressure on the shaft means.

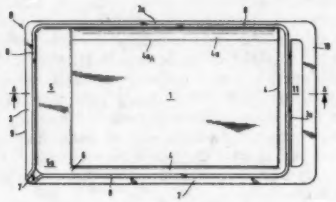
4,840,361
HOUSEHOLD BOARD

Hans-Jürgen Richter, Bad Soden-Salmünster, Fed. Rep. of Germany, assignor to Allstar Vergrauchsguter GmbH, Rodgau-Niederroden, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,003
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705132
Int. Cl.[4] B23Q 3/00
U.S. Cl. 269—289 R 5 Claims

1. A household board comprising a cutting surface, a working surface opposing said cutting surface, two opposing long sides and two opposing short sides, wherein said cutting surface is slightly sloped from one of the long sides to the other of the long sides and comprises a juice channel located at the periphery of the cutting surface and extending along the two

sides and one of the short sides, a juice collecting chamber communicating with the juice channel and located at the periphery of the cutting surface and extending along the other of the short sides, one end of said juice collecting chamber being



deeper than an opposing end thereof, and a pouring spout located at said one end of the juice collecting chamber, and wherein the working surface comprises a plurality of ribs which divide the working surface into a plurality of chambers.

4,840,362

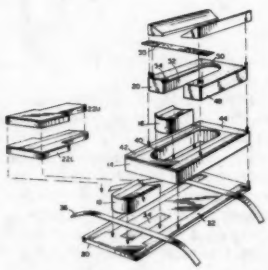
APPARATUS FOR POSITIONING AND SUPPORTING A PATIENT FOR SPINAL SURGERY

Ross L. Bremer, 1502 Beach Ave., Atlantic Beach, Fla. 32233, and Howard P. Hogshead, Jacksonville, Fla., assignors to Ross L. Bremer, Atlantic Beach, Fla.

Filed Feb. 4, 1988, Ser. No. 152,225

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 **30 Claims**



1. An assemblage for positioning and supporting a surgical patient, comprising:

a generally rectangular base block formed of resilient material having length, width and depth dimensions and a central opening;

a generally elongated U-shaped block formed of resilient material having a base and a pair of leg portions extending from said base defining a central opening and having length, width and depth dimensions;

means for releasably securing said U-shaped block and said base block one to the other with said U-shaped block superposed on said base block and said openings in registration one with the other;

a face and chest block formed of resilient material superposed at least in part on said base block adjacent the end of said U-shaped block remote from said base thereof for receiving the face and chest of the patient;

a pair of elongated blocks formed of resilient material superposed on the legs of said U-shaped blocks to define a space laterally therebetween in registry with the openings in said U-shaped block and said base block whereby the abdomen and diaphragm of the patient may depend freely in a direction toward said space and openings; and

means for releasably securing said pair of blocks and said U-shaped block one to the other.

4,840,363

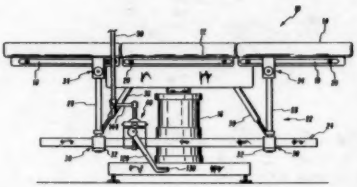
TELESCOPING, STERILE UPRIGHT SUPPORT ASSEMBLY

Bernard E. McConnell, Rte. 2, Box 87, Greenville, Tex. 75401

Continuation of Ser. No. 794,388, Nov. 4, 1985, Pat. No. 4,702,465, which is a continuation-in-part of Ser. No. 598,579, Apr. 10, 1984, Pat. No. 4,579,324, which is a continuation of Ser. No. 267,523, May 27, 1981, abandoned. This application Oct. 26, 1987, Ser. No. 113,676

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 **9 Claims**



1. Apparatus for positioning a patient's limb within a sterile field defined above a patient support surface of an operating table, said positioning apparatus comprising, in combination:

a support rail adapted for suspension from said operating table in a horizontal orientation below said patient support surface;

an adjustable clamp assembly slidably mounted on said support rail for bidirectional displacement, said clamp assembly including universal positioning means movably mounted onto said clamp assembly for variable angular orientation relative to said patient support surface;

a tubular receiver attached to said universal positioning means;

an extendable support arm movably coupled to said tubular receiver; and,

coupling means mounted onto said tubular receiver and releasably engagable with said support arm for securing said support arm in an extended position relative to said tubular receiver.

4,840,364

COMBINATION FOLDING AND CUT PRODUCT ATTACHMENT APPARATUS

Eckhard Schneider, Stadtbergen, Fed. Rep. of Germany, assignor to Man - Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 111,042

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636244

Int. Cl.[4] B41L *43/04*

U.S. Cl. 270—38 **6 Claims**

1. Combination folding and cut product or sheet attachment apparatus, particularly for association with a material handling system, for example from a printing machine, delivering printed products in cut sheet form, comprising

a first folding blade cylinder (5) having pick-up needles (6) located on the cylinder;

a first folding flap cylinder (8) having folding flaps (9) cooperating with said first folding blade cylinder for receiving the products and forming a first cross fold therein;

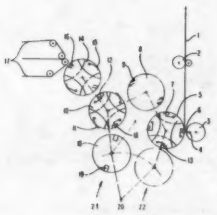
a second folding blade cylinder (10) having folding blades (12);

a second folding flap cylinder (14) having folding flaps (16) cooperating with said second folding blade cylinder (10)

for receiving the products and forming a second cross fold therein, and wherein

said first folding flap cylinder (8) essentially includes only said folding flaps (9);

and said second folding blade cylinder (10) is formed with grippers (11) for receiving and gripping said products from said first folding flap cylinder (8) and, upon folding operation of the folding blades (12) on the second folding blade cylinder, forming a second cross fold by pushing the products into the folding flaps (16) of the second folding flap cylinder (14), and



wherein, further, a stapling cylinder (18) is provided, having a stapling mechanism thereon,

and each of said blade cylinders (5, 10) has a staple closing means (13) located thereon,

said stapling cylinder (18) being selectively engageable with a selected one of said folding blade cylinders (5, 10) and, upon engagement therewith, for stapling the products, said staple closing means (13) on the selected folding blade cylinder closing the staples applied thereto.

4,840,365

APPARATUS FOR RECEIVING AND TRANSPORTING FOLDED SHEETS OR SHEET PACKAGES

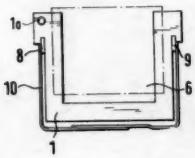
Ingo Kobler, Anhausen, and Godber Petersen, Augsburg, all of Fed. Rep. of Germany, assignors to MAN ROLAND Druckmashinen AG, Offenbach am Main, Fed. Rep. of Germany

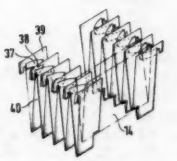
Filed May 29, 1987, Ser. No. 56,786

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621832

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—54 **29 Claims**





1. Apparatus for receiving and transporting folded sheets having a fold line or spine and two essentially parallel sheet elements, which can be spread apart,

comprising

a plurality of carrier segments (1, 33, 34) defining upper and lower regions and connected alternately at the upper and lower regions to form a segment array or assembly of zig-zag or accordion or bellows pleat form, said segments being connected in such a way that, upon application of a force to a segment longitudinally of the segment array or assembly, subsequent connected segments will be pulled, or pushed elastically to expand or compress accordion-like so that said segments will be, selectively, drawn or spread apart or expanded and compressed towards each other; and

a support means (8, 9; 47, 50) supporting said segments for movement between said compressed and expanded positions, said segment array or assembly forming in a direction longitudinally of the array or assembly an elastically expansible or compressible sheet holding structure to receive folded sheets and support said folded sheets for, respectively, expanding or spreading apart and compressing said supported sheets upon expansion and compression, respectively, of the segments.

4,840,366

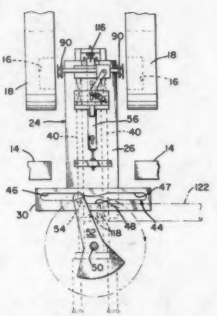
IN-MOLD LABELING APPARATUS AND METHOD

Brian J. Johnston, York, and Paul W. Klinedinst, Windsor, both of Pa., assignors to Graham Engineering Corporation, York, Pa.

Filed Aug. 27, 1987, Ser. No. 90,237

Int. Cl.[4] B29C *49/24*

U.S. Cl. 271—9 **25 Claims**



1. An in-mold labeling apparatus comprising

(a) a label transport assembly movable along a first path extending between a label pick up position and a labeling position, the assembly having

i. a label transfer head,

ii. a label pick up means on the head, and

iii. a follower member;

(b) a power drive for the label transport assembly, the power drive having

i. a drive member, and

ii. a power drive means for continuously moving the drive member repetitively around an endless second

(c) connection means joining the drive member directly to the follower moving the label transport assembly back and forth the first path only as the drive member is moved around the second and

(d) label transfer head drive means for extending and retracting the label transfer head at the label pick up position and at labeling position

(e) whereby during each cycle of movement of the drive member around the second path the label transfer assembly is moved back and forth between the label pick up and labeling positions and the label transfer head is extended and retracted to pick up a label at the pick up position,

carry the label to the labeling position and place the label in a mold half and return to the pick up position.

4,840,367

CASSETTE WITH A TAPE BOX FOR TAPE DISPENSERS OF MAIL PROCESSING MACHINES

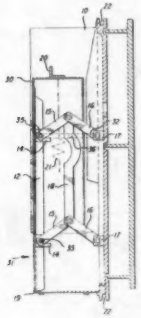
Oswald Geyer, Altenstadt; Helmut Lembens, Wiesbaden-Naurod, and Helmut Stoyhe, Obertshausen, all of Fed. Rep. of Germany, assignors to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 120,875

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 8630748[U]

Int. Cl.[4] B65H *1/12*

U.S. Cl. 271—160 **9 Claims**



1. Cassette for tape dispensers of mail processing machines, comprising a housing having a dispenser opening formed therein, stop beads formed on said housing at said dispenser opening, a tape box disposed in said housing for receiving tapes, a bearing plate disposed in said tape box, a magazine spring pressing said bearing plate against tapes in said tape box and pressing the tapes against said stop beads, and a parallel guidance device guiding said bearing plate parallel to said dispenser opening, said parallel guidance device including upper pivotally connected scissors members and lower pivotally connected scissors members, and a connecting rod connected between said upper scissors members and said lower scissors members.

4,840,368

BILL CONTAINING BOX APPARATUS OF BILL RECEIVING AND DISPENSING MACHINE

Kazuhiro Uehara, Tokyo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,277

Claims priority, application Japan, Oct. 31, 1986, 61-167583[U]

Int. Cl.[4] B65H *1/00*

U.S. Cl. 271—162 **5 Claims**

1. A bill receiving and dispensing machine for receiving and dispensing bills, said machine comprising:

a machine body,

a front door forming a part of said machine body,

a bill containing box of a substantially rectangular configuration normally carried obliquely in said machine body adjacent to said front door and said box being swingable in said machine body and removable from said machine body and bills stacked in said box are normally inclined,

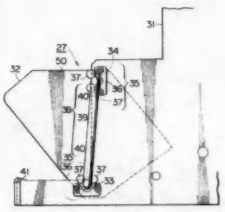
a pair of frame members disposed at opposite sides of said bill containing box,

a pair of lower notches formed in said frame members and facing upward,

a pair of upper notches formed in said frame members and facing the front of said machine body,

an upper opening formed on said bill containing box and oriented upwardly for receiving and removing bills therefrom,

a bottom opening formed on a bottom end of said bill containing box and normally oriented obliquely downwardly for communicating with a dispensation bill feed-out apparatus which feeds bills out of said bill containing box, and



a pair of engaging members mounted on opposite sides of said bill containing box, said pair of engaging members including upper engaging portions extending horizontally for engaging with said upper notches, handle portions extending from said upper engaging portions for carrying said bill containing box and through which said bill containing box can be removed from said machine body, and lower engaging portions extending horizontally from said handle portions for engaging with said lower notches.

4,840,369

APPARATUS FOR CONVEYING SHEET MEMBER

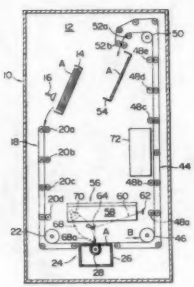
Motoaki Takahashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1987, Ser. No. 38,112

Claims priority, application Japan, Apr. 14, 1986, 61-85251; Apr. 15, 1986, 61-86497; Apr. 15, 1986, 61-86498; Apr. 15, 1986, 61-86499

Int. Cl.[4] B65H *5/22*

U.S. Cl. 271—276 **2 Claims**



1. An apparatus (**24**) for conveying a sheet member (A) by a conveyor roller having an axis perpendicular to the direction of conveyance of said sheet member, comprising:

at least one suction roller (**28**) constituting said conveyor roller and having a hollow cylindrical body and a multiplicity of suction holes (**40**) formed in a smooth and unobstructed outer wall of said cylindrical body;

a chamber (**26**) surrounding and rotatably mounting said suction roller and having a planar wall (**36, 38**) provided therein with at least one elongated slit (**30**) through which said suction holes are exposed in a region parallel to the

axis of said suction roller, said suction roller being mounted in said chamber such that an uppermost surface of the roller, disposed in said slit, lies flush with said planar wall; and

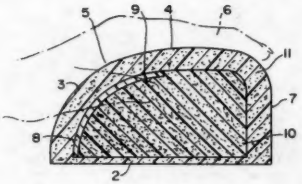
means for applying a vacuum to said exposed suction holes via said chamber, unexposed suction holes lying within the chamber, and an unobstructed interior of said hollow cylindrical body such that, upon rotation of said roller, said sheet member is conveyed over said chamber wall in a direction perpendicular to said slit and roller axis.

4,840,370

HAND AND DIGIT EXERCISER

Thomas W. Biddlecombe, 3 Burne Court, Kew, Victoria, Australia 3101

Filed Jul. 22, 1981, Ser. No. 285,325
Claims priority, application Australia, Jul. 29, 1980, PE4742
Int. Cl.[4] A63B *21/30*
U.S. Cl. 272—68 **10 Claims**



1. A hand and digit exerciser comprising a block of resilient material having a cross-section incorporating a flat base, a convex leading edge extending upwardly and forwardly from said base merging into an upper surface sized and shaped such that the base may be placed upon a flat surface with the forearm of the user extending along that surface, the palm of the hand placed over the rounded leading edge and the fingers extending along the upper surface, said block incorporating a reinforcing member positioned therewithin near the rounded leading edge and arranged to substantially retain the shape of the rounded leading edge when the remainder of the block is deformed by the fingers of the user.

4,840,371

NOVELTY GOLF CLUB WITH PROGRAMMED SOUND PLAYING DEVICE

John C. Harris, 310 Sound Beach Ave., Old Greenwich, Conn. 06870

Filed Nov. 24, 1987, Ser. No. 124,245
Int. Cl.[4] A63J *5/04, 23/00*; A63B *69/36*
U.S. Cl. 272—8 N **6 Claims**

1. A novelty device made to resemble a golf club comprising:

(a) a club head, an elongated shaft connected to said club head and a handle connected to an end of said elongated shaft remote from said club head;

(b) a hollow chamber formed in said club head and having mounted therein a sound producing device programmed to play a novelty program;

(c) said sound producing device being battery powered;

(d) said handle being hollow and having contained therein a battery chamber adapted to contain battery means for powering said sound producing device, said battery chamber opening at an end of said handle and further including a cap removably placeable over said opening; and

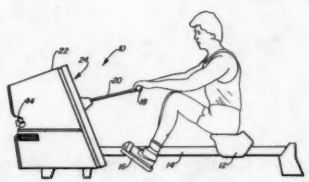
(e) electrical conductors extending within said elongated shaft between said battery chamber and said hollow chamber for electrically interconnecting said battery means with said sound producing device.

4,840,372

DIAGNOSTIC TESTING SYSTEM FOR AN EXERCIE MACHINE

Gary Oglesby, Lombard, and Bryan Andrus, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Oct. 21, 1986, Ser. No. 921,696
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—72 **15 Claims**



1. In an exercise machine having a plurality of components including means for providing a force to oppose exercising movements of a user, a diagnostic system to allow various of said components to be checked for maintenance comprising:

input means actuable by authorized personnel for initiating diagnostic testing of one or more of said components; and

processing means for controlling in a test mode the operation of a plurality of said components including said opposition force providing means, said processing means being responsive to said input means for controlling said opposition force means to operate in said test mode.

4,840,373

FOUR-BAR RIGID-DRIVE VARIABLE RESISTANCE PECTORAL FLY MACHINE

Henry H. Maag, 5332 Clark Cir., Westminster, Calif. 92683

Filed Mar. 24, 1988, Ser. No. 172,550
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **1 Claim**

1. An exercise machine for exercising the shoulder-joint horizontal-flexion muscles of an operator, comprising:

—a rigid frame including a base portion and an upstanding

portion having a front, rear, top and bottom, wherein the bottom is rigidly secured to the base portion;

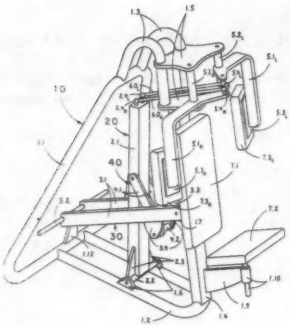
—an operator back constraint pad attached to the front side of said upstanding portion;

—an operator seat support pad attached to the front side of said upstanding portion in a position where it will engage the operator's seat while said operator is in a seated position of operation with his back engaging said back constraint pad;

—a pair of rigid counter-rotating assemblies mounted at the top of the front side of said upstanding portion so as to rotate about respective first and second substantially vertical axes, wherein said first substantially vertical axis is positioned to be coaxial with the vertical axis of rotation of said operator's right shoulder joint while said operator is in the operating position and said second substantially vertical axis is positioned to be coaxial with the vertical axis of rotation of said operator's left shoulder joint while said operator is in the operating position;

—said pair of rigid counter-rotating assemblies are comprised of respective cranks with offset arms which include respective contact surfaces for engaging the operator's respective right and left exercising upper arms while in said operating position;

—a rigid rotating effort arm assembly which is journaled to said frame to rotate about a first horizontal axis which is perpendicular with said first and second substantially vertical axes;



—a pair of rigid connecting links comprising slider linkages pivotally joining from the distal end of said rotating effort arm to respective pivotal points of connection on said respective counter-rotating assemblies in such a way that the respective counter-rotating assemblies rotate in opposite directions, thereby when said rotating effort arm assembly rotates toward said counter-rotating assemblies said pair of respective connecting links will cause said respective counter-rotating assemblies to rotate in opposite directions;

—a rigid rotating weight arm assembly which is journaled to said frame to rotate about a second horizontal axis which is both parallel with and separated by a specific distance from said first horizontal axis;

—said rotating weight arm assembly includes means for loading weights onto at a point offset from said second horizontal axis;

—said rotating effort arm assembly and said rotating weight arm assembly are mechanically linked to each other at third and fourth horizontal axes which are both parallel with and offset by specific distances from said first and second horizontal axes respectively, by a rigid connecting link which has a specific length between its centers of connection;

—said rotating effort arm assembly, said rotating weight arm assembly, said connecting link mechanically joining said rotating effort arm assembly to said rotating weight arm assembly, and said frame of said exercise machine join together to form a four-bar linkage system, which functions in conjunction with the rotating weight arm assembly and the crank and slider linkages constituted by the counter-rotating assemblies and their connecting links, to provide a variably resistive force at said upper arm engaging contact surfaces, which force varies as a function of the positions of said counter-rotating assemblies.

4,840,374

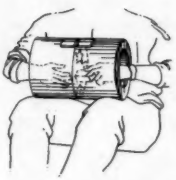
GAME UTILIZING THE SENSE OF TOUCH

Robert M. Skinner, 15300 S. Irving, Dolton, Ill. 60419

Filed Jul. 2, 1987, Ser. No. 69,280

Int. Cl.[4] A63F *9/06*

U.S. Cl. 273—1 G **7 Claims**



1. A game or training device comprising a hollow container having two sections with open ends and with an aperture plate having a plurality of apertures of different sizes interposed between said two sections, the two sections being separable for removal of the aperture plate with suitable means for holding said sections together in an assembled relation.

4,840,375

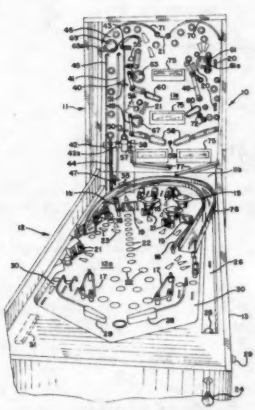
PINBALL MACHINE

Patrick M. Lawlor, 24308 Tomlin Rd., Marengo, Ill. 60152, and Lawrence E. DeMar, 1660 North LaSalle St., Chicago, Ill. 60614

Filed Jun. 17, 1987, Ser. No. 63,126

Int. Cl.[4] A63D *3/02*; A63F *7/22*

U.S. Cl. 273—121 A **29 Claims**



1. A pinball machine comprising:

a first generally horizontal playfield which includes targets and at least one means operable by a player for propelling a ball that has been put in play on the first playfield, and

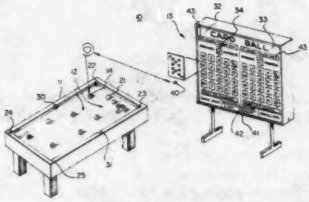
a second generally vertical non-pachinko playfield which includes targets and at least one means operable by a player for repeatedly propelling a ball that has been put in play on the second playfield in a manner in which said ball can be indefinitely kept in play on said second playfield.

4,840,376

POKER AND POOL APPARATUS

Michael J. Garret, Delta, Canada, assignor to Cardball International Limited, Delta, Canada

Filed Nov. 23, 1987, Ser. No. 123,867
Claims priority, application Canada, Nov. 21, 1986, 523605
Int. Cl.[4] A63D *15/00, 15/20*
U.S. Cl. 273—14 **11 Claims**



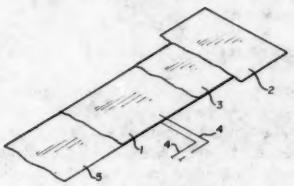
5. A poker type pool game comprising a plurality of balls, each of said balls being marked to indicate a separate and particular card of a deck, a scoreboard operable to be mounted separate from a pool table, said scoreboard indicating each of said cards corresponding with the card marking on a respective ball, and a plurality of switches on said scoreboard one for each of said cards and mounted adjacent thereto, each of said switches being manually operable to indicate which of said cards corresponds to a ball operable to enter a pool table pocket.

4,840,377

ELECTRICAL TAPE BOUNDARY SENSOR APPARATUS

C. Frederick Bowser, 121 E. Church St., Homer City, Pa. 15748, and John L. Kurtz, Indiana, Pa., assignors to C. Frederick Bowser, Homer City, Pa.

Filed Dec. 14, 1987, Ser. No. 132,586
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—31 **5 Claims**



1. A tape boundary sensor apparatus comprising:
(a) elongated sensor means adapted to be positioned along various boundary lines;
(b) conditioning circuit means electrically connected to the sensor means for filtering out unwanted signals and fluctuations from an output waveform of the sensor means;
(c) multiplexer means electrically connected to the conditioning circuit means for scanning the output of the sensor means for identifying a particular sensor of the sensor means which has been impacted by an object;
(d) analog to digital converter means for converting the analog output waveform of the sensor means to a proportional digital word;
(e) processor and memory means electrically connected to the converter means and to the multiplexer means for comparing the output waveform to known pre-set thresholds of:
(i) slope of the initial section of a known output waveform of the sensor for determination of the surface area of impact;
(ii) peak voltage of a known output waveform of the sensor for determination of the force of impact;
(iii) a known duration of impact; wherein the slope, peak voltage, and duration are compared to the pre-set thresholds to determine and confirm what kind of object impacted the sensor; and
(g) indicator means connected to the processor and memory means;
wherein an impact on a sensor causes a voltage output therefrom and the processor makes a determination whether a ball has caused the impact, and directs the results of the analysis to the indicator means.

4,840,378

SOFTBALL

Robert P. Molitor, Niles, Mich., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.

Continuation of Ser. No. 876,505, Jun. 20, 1986, Pat. No. 4,725,058. This application Nov. 30, 1987, Ser. No. 126,320
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[4] B29C *27/08*
U.S. Cl. 273—60 B **7 Claims**

1. A softball having a substantially solid core and cover wherein the ball has a circumference of substantially 12 inches, a weight of 175 to 198 grams, a coefficient of restitution of substantially 0.478 and a compression from 0.010 to 0.014 inches wherein said core has a density from 15.5 to 16.5 pounds per cubic foot, a hardness from 72 to 78 on the Shore A scale, said core being formed from a cellular polymeric material, wherein said cover has a specific gravity of substantially 1.2, and a thickness from 0.035 inches to 0.060 inches, and a Shore A hardness from 70 to 90, said cover being formed from a vinyl resin of the homopolymer or copolymer dispersion type, a liquid plasticizer for a vinyl resin, stabilizers and a white pigment dispersion such as a titanium dioxide dispersion.

4,840,379

SPLIT SEALING RING HAVING A BIAS CUT

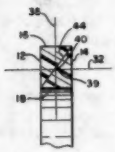
Richard A. Thoman, Jr., Kulpsville, Pa., assignor to Greene, Tweed & Co., Kulpsville, Pa.

Filed Jun. 29, 1988, Ser. No. 213,024
Int. Cl.[4] F16J *9/14*
U.S. Cl. 277—222 **7 Claims**

1. An improved, generally annular split sealing ring having generally curved radially inner and radially outer surfaces and opposed first and second axial surfaces extending between the radially inner and outer surfaces, the sealing ring having an axially extending, radially centered axis and a cut extending therethrough from the inner radial surface to the outer radial

surface to create a gap for facilitating installation and removal of the sealing ring, wherein the improvement comprises:

the cut extending through the sealing ring along a single continuous cut plane, the orientation of the cut plane being determined by establishing a first reference plane extending radially through the sealing ring and generally parallel to and through the axis, a second reference plane extending generally perpendicular to the first reference plane and generally midway between the first and second axial surfaces to establish a first generally radially extending reference line, and a third reference plane extending generally perpendicular to the first and the second reference planes and midway between the inner and outer radial surfaces to establish a second generally axially extending reference line and a third reference line, the cut plane being oriented at a first predetermined angle with respect to the second reference plane and the first reference line, and at a second predetermined angle with respect to the third reference plane and the third reference line.



4,840,380

SET OF GOLD CLUBS

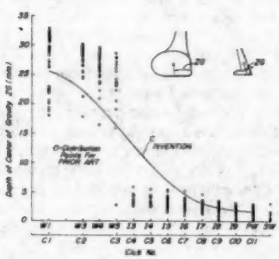
Ryota Kajita, Matsudo; Hiroshi Esaki, Yokohama, and Hirato Shimazaki, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 813,454, Dec. 26, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 211,152

Claims priority, application Japan, Dec. 25, 1984, 59-277156; May 31, 1985, 66-118391

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—77 A **5 Claims**



1. A continuous golf club set comprising:

at least one club having its center of gravity located along a line perpendicular to the club striking face thereof at an inward distance of at least 15 mm therefrom, at least one club having its center of gravity located along a line perpendicular to the club striking face thereof at an inward distance therefrom of between 10 mm and less than 15 mm, and at least one club having its center of gravity located along a line perpendicular to the club striking face thereof at an inward distance of less than 10 mm therefrom, said continuous set having clubs ordered from a longer to a shorter driving distance with increasing loft and lie angles, said clubs having:

(a) a club length for each club decreased within a range of 15–30 mm in said club order;

(b) for each clubhead, a club loft and lie are increased within a loft angle range of 3°–5° and a lie angle of not more than 2°, in said club order; and

(c) for each clubhead a sole width is decreased not more than 15 mm in said club order.

4,840,381

GOLF BALL

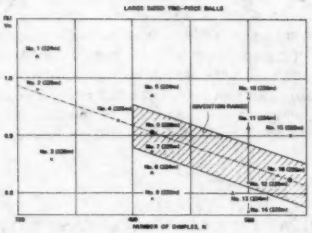
Keisuke Ihara, Tokyo; Yasuhide Alaki, Saitama, and Jun Nomura, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 28,590, Mar. 20, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,899

Claims priority, application Japan, Mar. 20, 1986, 61-63668

Int. Cl.[4] A63B *37/14*

U.S. Cl. 273—232 **4 Claims**



1. A golf ball having a plurality of recessed dimples on the surface thereof, wherein the golf ball is a large sized two-piece ball consisting of a core and a cover; the maximum diameter of the dimples is 2 to 4 mm; the maximum depth of the dimples is 0.1 to 0.4 mm; the number of dimples is 400 to 600; at least 90% of the dimples have a value of Vo in the range defined by the following equation:

$$0.35 \leqq Vo \leqq 0.47$$

wherein Vo is the volume of each dimple confined below a plane defined by the dimple edge divided by the volume of a cylinder whose bottom is defined by said plane and whose height is defined by the maximum dimple depth from the bottom; and the total volume ratio Vr of the dimples is defined by the following equation:

$$Vr = Vs/(4\pi R^3/3) \times 100$$

wherein Vs is the sum of the dimple volumes as defined above, and R is the radius of the ball in the range defined by the following equation:

$$V_{RL} - N/1500 \leqq Vr \leqq V_{RU} - N/1500$$

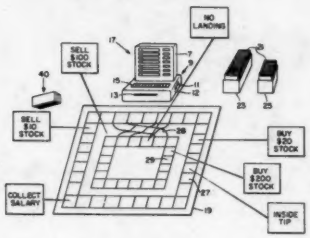
wherein V_{RL} is not less than 1.14 inclusive, V_{RU} is not more than 1.22 inclusive, and N is the number of the dimples and ranges from 400 to 600 both inclusive.

4,840,382

ELECTRONIC CARD READER AND FINANCIAL ASSET GAMES

Kenneth L. Rubin, 24 June St., Westwood, Mass. 02090

Filed Jan. 20, 1988, Ser. No. 146,220
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—237 **28 Claims**



1. Game apparatus for a competitive game to be played by two or more players comprising:

a display for indicating a current state of the game;

a plurality of cards encoded with different information affecting the current state of the game;

processor means for receiving signals and processing signals to determine the state of the game;

a card reader logically connected to the processor means for reading at least one card at a time and generating signals indicative of the encoded information read from the card; and

player input means for allowing players to communicate to the processor means, a player communicating decisional information to the processor means through the player input means, and the player input means generating player decision signals indicative of the decisional information from the player;

the processor means being responsive to both the signals generated by the card reader and the player decision signals by causing a change from the current state of the game to a new state of the game with respect to the encoded information read from the card, the decisional information communicated by the player and any previous information, and by causing the display to provide an indication of the new state of the game, the state of the game being effectively controlled by the player communicated decisional information and the encoded information read from the card.

4,840,383

ILLUMINATED DART

James W. Lombardo, 829 Delphi Rd., Olympia, Wash. 98502

Filed Oct. 29, 1987, Ser. No. 114,053
Int. Cl.[4] A63B *65/02*
U.S. Cl. 273—420 **7 Claims**

5. An illuminated dart, comprising:

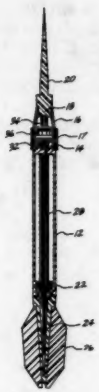
tip means;

hollow shaft means connected to said tip means;

electrical illumination means in said shaft means;

means for energizing said illumination means;

tail fin means connected to said shaft means; and



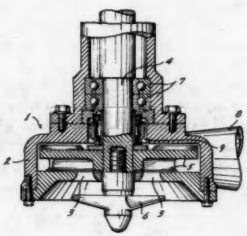
means for transmitting light from said illumination means to said tail fin means.

4,840,384

FACE-TYPE SHAFT SEAL WITH SHROUD

Glenn R. Dorsch, Aberdeen, Wash., assignor to Vaughan Co., Inc., Montesano, Wash.

Filed Sep. 4, 1987, Ser. No. 93,464
Int. Cl.[4] F16J *15/36*
U.S. Cl. 277—12 **7 Claims**



1. In a liquid pump having a casing, a rotary pumping member mounted for rotation in such casing, a rotary drive shaft extending into the casing for rotating the rotary pumping member, bearing means mounting the shaft and sealing means for preventing access to the bearing means of the liquid being pumped from the casing including a first seal component encircling the drive shaft and mounted stationarily relative to the casing, a second seal component encircling and mounted for rotation with the drive shaft and a generally cylindrical liquid tight axially resilient member encircling the drive shaft, extending lengthwise therealong, having one end portion bearing on the second seal component and biasing such second seal component toward the first seal component to an abutting sealing condition, the improvement comprising a shroud attachment including a collar encircling and fitted on the shaft adjacent to the end of the resilient member remote from the sealing means, a shroud portion extending from said collar lengthwise of the drive shaft into overlapping relationship with the second seal component and enclosing the resilient member to shield the exterior of the resilient member, and a third seal

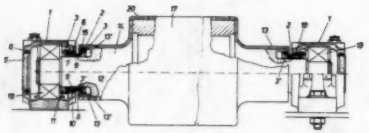
component carried by said shroud in slidable relationship axially of the shaft to the second seal component.

4,840,385

DEVICE FOR SEALING SHAFT BEARINGS OR SHAFT BEARING HOUSINGS

Helmut Senft, and Peter Hasenrath, both of Graz, Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Sep. 21, 1987, Ser. No. 99,456
Claims priority, application Austria, Sep. 24, 1986, 2551/86
Int. Cl.[4] F02F *11/00*
U.S. Cl. 277—53 **27 Claims**



1. A sealing bearing assembly for a shaft, comprising,

a bearing housing which has, at one end thereof, an annular groove with a bottom surface,

a first sleeve which surrounds and is immediately mounted on the shaft with a sealed clearance between the first sleeve and the shaft, said first sleeve being inserted in said bearing housing, said first sleeve having an outer circumferential surface provided with an annular projection which is fitted into the groove of the bearing housing, said projection being spaced from the bottom of the groove to provide a space, an annular seal in the space between the projection and the bottom of the groove, said first sleeve having at least one end with an inner circumferential surface provided with an annular recess, and a radial lip seal in said annular recess of the first sleeve, said first sleeve having at least one end portion that has a greater diameter than the portion that is beside the annular projection whereby, progressing in an axial direction, the first sleeve forms a step from its center toward its end, said shaft having an end area provided with an annular recess for forming a labyrinth seal, said first sleeve having an end which extends into the annular recess of the shaft and is formed to define a labyrinth gap between the first sleeve and shaft.

4,840,386

SOUND DEADENING DUAL SLEEVE SEALING ARRANGEMENT

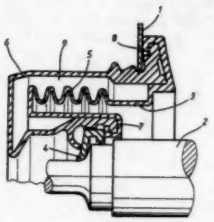
Karl Peitsmeier, Neuhausen, and Helmut Patzelt, Kernen-Stetten, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,442
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3709027
Int. Cl.[4] F16J *3/04, 15/52*
U.S. Cl. 277—212 FB **5 Claims**

1. A sealing sleeve arrangement for masking the aperture between a positionally stable wall and a shaft penetrating a bore in the wall, comprising:

a first sealing sleeve which abuts the wall and the shaft with respective end regions in a fixedly tight manner, and which forms a bellows which compensates an offset of the shaft within the bore dictated by tolerances, and

a second sleeve fixedly connectable to the first sealing sleeve such that when the second sleeve is connected to the first sealing sleeve the first and second sleeves form conjointly with their walls, in the region of the bellows, a closed sound insulating air chamber which chamber is closed by



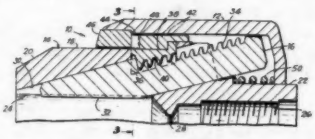
connection points when the sleeves are connected to one another.

4,840,387

SELF-ACTUATING KEYLESS CHUCK

Donald J. McCarthy, Wethersfield, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Filed Jan. 20, 1988, Ser. No. 146,279
Int. Cl.[4] B23B *5/22, 5/34*
U.S. Cl. 279—1 K **17 Claims**



1. A chuck for use with a powered driver having a drive shaft comprising generally cylindrical body means including a body member having a nose section and a tail section and a circumferential groove formed therein intermediate said nose and tail sections, said tail section having an axial bore formed therein to mate with said drive shaft of said powered driver and said nose section having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore and said circumferential groove, a plurality of jaw pieces slidably positioned in each of said angularly disposed passageways, each of said jaw pieces having a jaw face formed on one side thereof and threads formed on the opposite side thereof, split nut means rotatable mounted in said circumferential groove and in engagement with said threads of said jaw pieces, said split nut means including a split nut, a collar surrounding and securing said split nut, and at least one first impact dog, sleeve means rotatably mounted on said body member, said sleeve means including an impact ring and at least one second impact dog and spring means interposed between said body means and said sleeve means and adapted to bias said second impact dog into juxtaposition with said first impact dog.

4,840,388

GROCERY CART

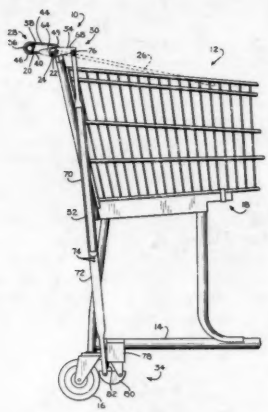
Robert E. Doughty, 940 South 134th, Bonner Springs, Kans. 66012

Filed Nov. 27, 1987, Ser. No. 126,187
Int. Cl.[4] B62B *5/04*
U.S. Cl. 280—33.994 **11 Claims**

10. An automatic braking apparatus in combination with a user-propelled grocery cart, luggage cart or the like having support wheels and a transverse handle rearwardly spaced from the body of the cart, said braking apparatus comprising:

a braking mechanism for shiftably coupling with the cart and for shifting between braked and released positions, said mechanism including braking means for braking at least one support wheel when in said braked position and for releasing said wheel for unbraked rotation thereof when in said released position;

pivot structure for pivotally coupled with the cart about a fixed pivot point adjacent one end of the cart handle for pivotal shifting between braked and released positions, said pivot structure presenting first and second, opposed, connection portions;



connecting means connecting said first connection portion with said braking means for mutual, corresponding, shifting of said pivot structure and braking means between said braked and released positions; and

handle means for pivotally coupling with the cart handle for pivotal shifting between braked and released positions and including means for coupling with said second connection portion for mutual, corresponding, shifting of said handle means and pivot structure, and thereby said braking means, between said braked and released positions,

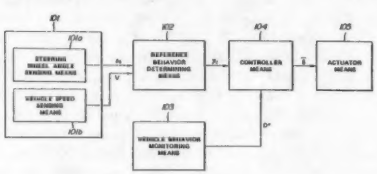
said handle means and pivot structure being shiftable in opposed rotational directions during mutual corresponding shifting between said braked and released positions.

4,840,389

VEHICLE STEER ANGLE CONTROL SYSTEM BASED ON MATHEMATICAL MODEL

Taketoshi Kawabe, Tokyo, and Ken Ito, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 9, 1987, Ser. No. 106,444
Claims priority, application Japan, Oct. 13, 1986, 61-241430
Int. Cl.[4] B62D *6/02*
U.S. Cl. 280—91 **16 Claims**



1. A steer angle control system for a controlled vehicle having at least one steerable first wheel, comprising:

sensor means for sensing conditions of said controlled vehicle, said sensor means comprising means for sensing a steering wheel angle of said controlled vehicle and providing a sensed steering wheel angle, and means for sensing a vehicle speed of said controlled vehicle and providing a sensed vehicle speed,

reference behavior determining means, connected with said steering wheel angle sensing means and said vehicle speed sensing means, for determining a value of a reference output motion variable of a predetermined reference mathematical model, corresponding to said sensed steering wheel angle and said sensed vehicle speed by solving said reference model,

vehicle behavior monitoring means for determining a value of a plant output motion variable which is a linear combination of a yawing motion variable of said controlled vehicle and a side motion variable of said controlled vehicle,

controller means, connected with said reference behavior determining means and said vehicle behavior monitoring means, for producing a control signal representing a target first wheel steer angle so as to reduce a deviation of said plant output motion variable from said reference output motion variable, and

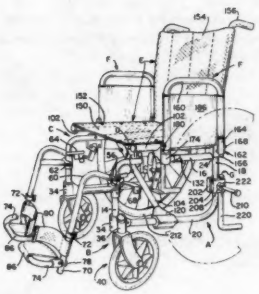
actuator means for varying an actual first wheel steer angle of said controlled vehicle in accordance with said control signal.

4,840,390

SYMMETRICALLY MODULAR WHEELCHAIR

Walter G. Lockard; Allen J. Boris, both of Elyria, and Wieslaw Kosc, North Royalton, all of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Filed Sep. 30, 1986, Ser. No. 913,501
Int. Cl.[4] A61G *5/02*
U.S. Cl. 280—250.1 **16 Claims**



1. A wheelchair comprising:

left and right side frames, each side frame including upper and lower generally horizontal legs and generally vertical forward and rearward legs connected with the general horizontal legs;

a pair of rear wheels mounted to the side frames;

a pair of front wheel assemblies mounted to the side frames;

a seat portion operatively connected with the side frames;

a pair of seat side supports which are connected with side portions of the seat;

a pair of cross members, each cross member fixedly connected at an upper end to one of the side supports;

a pair of fittings, each fitting being fixedly connected with a lower end of one of the cross members and defining a side frame tubing section receiving aperture therein, each of the fittings receiving the generally horizontally disposed lower leg of one of the side frames therein for rotating movement thereon; and,

a projection and circumferentially extending guide slot arrangement interconnected with at least one of the fittings

and the horizontal leg received therein for maintaining the fitting and the side frame in alignment.

4,840,391

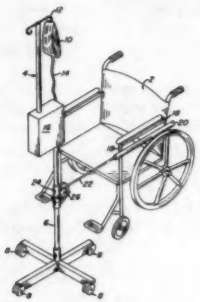
TRANSPORTATION OF HOSPITAL PATIENTS

Karl D. Schneider, 608 Hickory Cir., Canonsburg, Pa. 15317

Continuation-in-part of Ser. No. 40,989, Apr. 20, 1987, abandoned. This application Jul. 12, 1988, Ser. No. 223,266

Int. Cl.[4] A47C 7/62

U.S. Cl. 280—304.1 7 Claims



1. Attachment apparatus for joining a patient carrying wheeled vehicle to an intravenous pole assigned having an upstanding elongated IV pole mounted upon a wheeled base, said attachment apparatus comprising an elongated arm including two tubes telescopically received one within the other;

an elongated tubular housing formed by two arcuate segments connected by a hinge, one of said acruate segment being fixedly connected to an end of one of said tubes;

latch means releasably connecting said two arcuate segments into said tubular housing; and

stop means located within said tubes for limiting the extent of extension of said tubes, said tubes means including a positioning means anchored to one of said tubes and a flexible member having terminal end portions secured to the other one of said tubes.

4,840,392

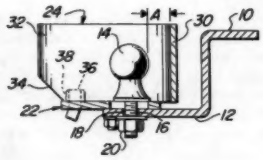
TRAILER HITCH GUIDE

Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash. 98445

Filed Apr. 11, 1988, Ser. No. 179,687

Int. Cl.[4] B60D 1/06

U.S. Cl. 280—477 1 Claim



1. A trailer hitch guide for guiding a hitch socket component on a trailer tongue into registry with a cooperating hitch ball component on a towing vehicle, the guide comprising:

(a) a flat mounting plate member arranged for attachment to a towing vehicle with a hitch ball projecting upwardly therefrom,

(b) a v-shaped guide fence member mounted removably on the mounting plate member and forming a vertically extending wall, the apex of the wall being configured to be positioned forwardly, with reference to the towing vehicle, of a hitch ball on the mounting plate member and the diverging wings of the wall being configured to diverge rearwardly, with reference to the towing vehicle, of the hitch ball on the mounting plate member for sliding contact by the socketed front end of a trailer tongue for guiding a hitch socket into registry with the hitch ball, and

(c) securing means interengaging the mounting plate member and guide fence member for releasably securing said members together, whereby the guide fence member is removable from the mounting plate member after the ball and socket components of the trailer hitch are hitched together,

(d) the securing means comprising a pair of studs secured to and projecting downwardly from the bottom edge of the fence member adjacent the diverging ends thereof, and stud-receiving openings in the mounting plate for removably receiving said studs,

(e) the portion of the studs projecting downwardly from the fence member extending angularly in the rearward direction, with reference to the towing vehicle, of said diverging ends, and

(f) the bottom corners of said ends of the diverging wings adjacent the studs being removed to form edges that extend angularly upwardly and rearwardly from the studs, whereby to facilitate removal of the guide fence member from the mounting plate member by rocking the fence member upwardly from the mounting plate member at the apex of the fence member.

4,840,393

WHEEL SUSPENSION FOR STEERABLE REAR WHEEL ON MOTOR VEHICLES EQUIPPED WITH FRONT WHEEL STEERING ESPECIALLY PASSENGER VEHICLE

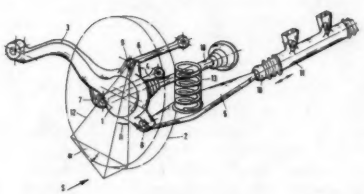
Rudolf Mueller, Dachau, and Ludwig Strasser, Ebersberg, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,944

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703196

Int. Cl.[4] B62D 9/00

U.S. Cl. 280—661 23 Claims



1. A wheel suspension for steerable rear wheels of motor vehicles equipped with front wheel steering, comprising: wheel carrier means for each rear wheel; each wheel carrier means having a longitudinal guide means connected thereto and extending at least approximately in the vehicle longitudinal direction and pivotally connected to a fixed vehicle part; plural cross guide means extending at least approximately in the vehicle transverse direction and pivotally connected to a fixed vehicle part; additional cross guide means displaceable in the vehicle transverse direction by an adjusting means for providing a steering motion to the rear wheels; and plural joint means each operatively connecting the cross guide means and the additional cross guide means with the wheel carrier means respectively; said plural joint means of the plural cross guide means defining the steering axis of rotation which is arranged in a plane extending substantially in the vehicle longitudinal

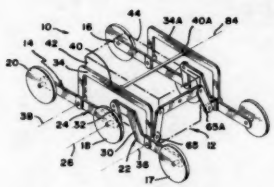
direction and inclined with respect to a vertical vehicle transverse plane in such a manner that it rises rearwardly.

4,840,394

ARTICULATED SUSPENSION SYSTEM

Donald B. Bickler, Temple City, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 21, 1988, Ser. No. 184,236
Int. Cl.[4] B62D *21/00*
U.S. Cl. 280—677 **4 Claims**



1. A vehicle moveable along the ground comprising:
a body having a width extending in a predetermined transverse direction;
a pair of side suspensions lying at either side of said body;
each side suspension including a pair of end wheels rotatable about transverse axes including a front wheel and a rear wheel, a middle wheel rotatable about a transverse axis, a rear linkage extending between said rear and middle wheels, a front linkage extending between said front wheel and said rear linkage, and a body link having front and rear ends pivotally connected respectively to said front and rear linkages;
one of said linkages of each side suspension including a first bogie link having opposite ends coupled to said middle wheel and one of said end wheels, and the other of said linkages including a second bogie link having a first end coupled to the other one of said end wheels and a second end and also including means coupling the second end of the second bogie link to the first bogie link which allows the second end of the second bogie link to pivot about a transverse axis and move forward and rearward; and
a transverse suspension for coupling said side suspensions to said body including an intermediate cross link having a middle pivotally coupled to said body about a longitudinal axis extending in a direction substantially perpendicular to said transverse axes and having a pair of ends, and a pair of end cross links each having an inner end pivotally connected to an end of said intermediate cross link and an outer end pivotally connected to an end of said body link.

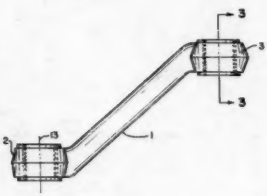
4,840,395

BUSHING FOR VEHICLE SUSPENSION

George Sturmon, P.O. Box 1241, St. Charles, Mo. 63302

Filed Aug. 21, 1986, Ser. No. 898,959
Int. Cl.[4] B60G *11/58*
U.S. Cl. 280—688 **14 Claims**

1. An interface rod connecting the frame, chassis and the body of a motor vehicle with respect to the axle, in conjunction with the spring and shock absorber system in the vehicle suspension system;
said interface rod comprising an extended rod having an opening at each of the opposite ends thereof, each of which openings is adapted to be mounted to a corresponding member at a fixed predetermined location in the vehicle suspension system such that a connection between the center point of the openings at the opposite ends of the rod and the corresponding points of the vehicle suspension system is achieved, wherein the improvement comprises:
an uninterrupted round cylindrical bushing ring forming the opening which is adapted to be interference fit with the corresponding member at the predetermined location in the vehicle suspension system;
said bushing ring being freely rotating with respect to said extended rod and concentrically mounted within a case polymer interface that is formed within an intrinsic larger hold in the rod;
said case polymer interface having a nominal hardness in the range of from 71 Type A Durometer to 53 Type D



Durometer, said hardness being chosen to allow said polymer to be compressed to absorb shock loads and to permit temporary misalignment of said rod and said corresponding members under stress, said case polymer interface being further secured in the intrinsic larger hole formed at the end of the rod;
whereby said cast polymer interface is fixed with respect to the intrinsic larger hole in the rod and rotatable with respect to said bushing ring.

4,840,396

REAR SUSPENSION SYSTEM FOR AUTOMOBILES

Kanji Kubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 123,870
Claims priority, application Japan, Dec. 9, 1986, 61-292985
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—690 **7 Claims**

1. A rear suspension system for automobiles comprising:
a trailing arm which extends substantially along a fore-and-aft direction of an automobile body and is pivoted to the automobile body at its front end;
a wheel support member connected to a rear end of the trailing arm in a laterally moveable manner relative thereto;
a first lateral link extending laterally between an upper portion of the wheel support member and the automobile body substantially along a horizontal direction;
a second lateral link extending laterally between a lower portion of the wheel support member and the automobile body substantially along a horizontal direction; and
a third lateral link extending laterally between an intermediate position of the wheel support member, located between the upper portion and the lower portion of the

wheel support member and behind a central axial line of a wheel axle of the wheel support member, and the automobile body substantially along a horizontal direction;

the second lateral link having a substantially same length as the third lateral link wherein the trailing arm extends substantially horizontally and the rear end of the trailing arm is pivoted to the wheel support member by way of a pivot pin which is slightly forwardly inclined from a vertical direction.

4,840,397

IMPACT PROTECTION DEVICE FOR THE OCCUPANTS OF MOTOR VEHICLES WITH A FILTER TO CLEAN THE DRIVING GAS

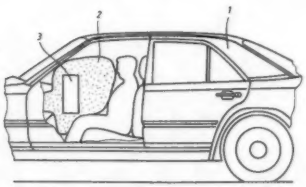
Egon Katz, Nagold; Alban Bossenmaier, Stuttgart, and Luigi Barmbilla, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,075

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644554

Int. Cl.[4] B60R *21/08*

U.S. Cl. 280—739 **6 Claims**



1. An impact protection device for an occupant of a motor vehicle, having a cushion which can be blown up in the event of a collision by means of a driving gas generated by combustion of solid gas-generating materials, a part of a wall of said cushion having a multiplicity of openings which are outlet flow openings from said cushion for said driving gas, and having a filter for cleaning solid combustion residues from said driving gas, wherein:

said outlet openings simultaneously form said filter and said filter comprises a fabric that does not stretch upon being blown up by the driving gas and which has a filter weave with a tearing force to DIN 53 354 of at least 1500N/5 cm, a further tearing force to DIN 53 536 with test body B of at least 150N, a heat resistance of at least 1 second at 300° C. without substantial reduction in strength, an unstressed pore size by means of which at least 50% of particles with a size of more than 0.1 μm are retained and an air permeability L in $L.cm^{-2}.min^{-1}$, which lies in the region enclosed by curves $L=0.05+0.075.p$ and $L=1.2+0.6.p$, and which has an area of 500 to 10,000 cm^2.

4,840,398

DRIVE ARRANGEMENT FOR A ROLL BAR OF MOTOR VEHICLES

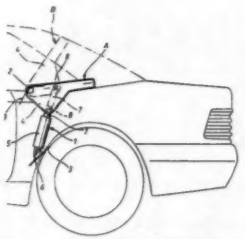
Klaus Matthias, Sindelfingen; Karl-Heinz Baumann, Bondorf; Gerald Schick, Garching; Arno Disson, Grafenau; Hermann Möller, Gärtringen; Holger Seel, Aidlingen; Claus Töpfer, Sindelfingen; Uwe Nerger, Sindelfingen; Peter Thiele, Sindelfingen, and Eugen Fleisch, Rottenburg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,182

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732562

Int. Cl.[4] B60R *21/00*

U.S. Cl. 280—756 **23 Claims**



1. A drive arrangement for a motor vehicle roll bar, comprising:

at least one piston-cylinder means including a support piston, guide cylinder and ejection spring for extending a roll bar, in response to a control pulse triggered by a crash situation, from a lowered rest position to an erected supporting position;

a controlled release locking means for releasing the support piston so that it can be extended out of said guide cylinder by an ejection spring and relocking said support piston in an extended end position;

drive means, connected to said at least one piston-cylinder means, for controlling the direction of movement and the speed of the spring-loaded support piston;

and cancelling means for cancelling the influence of the drive means on the spring-loaded support piston in response to a crash signal.

4,840,399

ANTI-SKID DEVICES FOR MOTOR VEHICLES

Hansjörg W. Rieger, Aalen, and Wolfgang Biehler, Aalen-Unterkochen, both of Fed. Rep. of Germany, assignors to Rud-Kettenfabrik Rieger & Dietz GmbH u.Co., Aalen, Fed. Rep. of Germany

Filed Jul. 18, 1986, Ser. No. 887,869

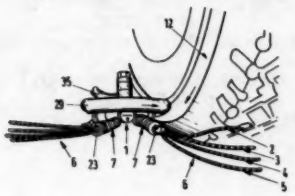
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3526360

Int. Cl.[4] B60C *27/00*

U.S. Cl. 280—757 **31 Claims**

1. Anti-skid device for motor vehicles with a plurality of chain strands (2, 3, 4, 5) retained by a support (1) which can be set into a revolving motion and connected to the latter by intermediate pieces (7) forming resilient spreading arms, of which the ends remote from the support (1) are thrown away from the support (1) by the effect of centrifugal force when the support (1) revolves in the service position, and at least parts of which pass through the region of the ground contact surface of the tyre (12) when the vehicle tyre (12) rotates, characterized in that chain strand groups, each of which groups comprises at least two chain strands, engage the outer ends of at least some of the intermediate pieces forming the resilient spreading arms, each of said intermediate pieces forming the resilient spreading

arms supporting at least one of said plurality of chain strands at the outer end of said intermediate piece, and at least some of said intermediate pieces forming said resilient spreading arms supporting one of said chain strand groups comprising at least



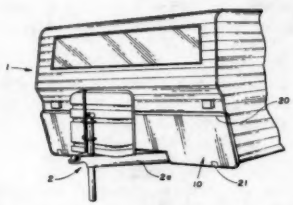
two of said plurality of chain strands at the outer end of said intermediate pieces, the number of said plurality of chain strands being greater than the number of said intermediate pieces.

4,840,400

GRAVEL SHIELD FOR HITCH TRAVEL TRAILER

Eugene F. Greenleaf, 117 W. Wright Pl., Marquette, Mich. 49855

Filed Sep. 3, 1987, Ser. No. 92,534
Int. Cl.[4] B60R *19/00*
U.S. Cl. 280—770 **11 Claims**



1. A gravel shield for hitch trailers, comprising:

a protective plate member having a solid unitary structure with a fixed form adapted to be firmly fixed in place;

said protective plate member having a width dimension approximately equal to the width dimension of a front portion of a hitch trailer to be shielded;

said protective plate member including a lower portion thereof which comprises means for cooperating with a tongue frame portion of said trailer; and

means for fastening said protective plate member fixedly in place adjacent said front portion of said hitch trailer to be shielded;

said fastening means comprising:

a U-shaped channel member adapted to be secured to and extend laterally across essentially the entire front portion of said hitch trailer, said channel member being adapted to securely receive an upper edge portion of said protective plate member therein; and

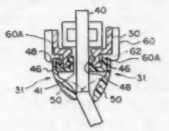
at least one pair of spaced clip members, each adapted to be secured adjacent a lower edge of said front portion of said hitch trailer to support a lower edge portion of said protective plate member.

4,840,401

GUIDE RAIL COVER

Tatsuo Yamashita, and Kazuyoshi Ishiguro, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakuso, Niwa, Japan

Filed Jul. 19, 1988, Ser. No. 221,617
Claims priority, application Japan, Jul. 21, 1987, 62-111620[U]; Aug. 21, 1987, 62-127143[U]
Int. Cl.[4] B60R *21/02*
U.S. Cl. 280—804 **19 Claims**



1. A guide rail cover disposed along a guide rail having a guide groove for guiding a slider retained an end of a webbing for fastening an occupant of a vehicle in forward and backward directions of said vehicle, comprising:

a base made of a rigid synthetic resin and disposed to the guide rail; and

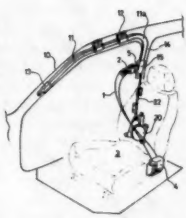
a filler made from a nonrigid synthetic resin and extending from said base in a direction for closing said guide groove.

4,840,402

AUTOMATIC LOCKING AND RELEASING ARRANGEMENT FOR VEHICULAR SEAT BELT

Kazuo Yamamoto, Sagamihara; Katsuyasu Ono, Yokohama, and Shinichi Yamamuro, Toyoake, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha and Chuo Hatsujo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,436
Claims priority, application Japan, Jan. 29, 1988, 63-17337
Int. Cl.[4] B60R *22/06*
U.S. Cl. 280—804 **8 Claims**



1. An automatic locking and releasing arrangement for vehicular seat belt including:

a guide rail mounted along an opening portion of a vehicular door on the inside surface of the door pivotably disposed within said opening portion;

a cable adapted to slide through a first guide passage formed in the guide rail;

a drive means for driving the cable;

a connector and a cam both fixed to the cable at a predetermined spacing from each other;

a slider fitted slidably in a second guide passage formed in the guide rail in communication with the first guide passage, and adapted to engage the connector and the cam and slide through the second guide passage of the guide rail;

a seat belt attached to the slider;

an anchor means for retaining the slider in a locking position of the seat belt; and

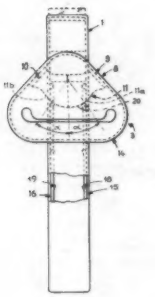
a ring-like slide member fixed to a core of the cable portion positioned at least between said connector and said cam, said ring-like slide member comprising a plurality of slide portions arranged at slight intervals in the longitudinal direction of the cable through a flexible portion formed between adjacent said slide portions, the section of each said slide portion in a plane perpendicular to the core of the cable having a smaller diameter than the section of said first guide passage, and the cable being slid through the first guide passage of the guide rail by said slide portions of said ring-like slide member.

4,840,403

DEVICE FOR ADJUSTING THE POSITION OF A STRAP RETURN ELEMENT, IN PARTICULAR OF A SAFETY BELT FOR AN AUTOMOBILE VEHICLE

Gerard Escaravage, Valentigney, France, assignor to Ecia Equipements et Composants pour L'Industrie Automobile, Audincourt, France

Filed May 18, 1988, Ser. No. 195,339
Claims priority, application France, May 27, 1987, 87 07509
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 **7 Claims**



1. A device for adjusting the position of a strap-return element of a safety belt between two end positions, said device adapted to be mounted in particular on a post of an automobile vehicle, and said device comprising:

a guide rail adapted to be fixed to said post and having a front side and a rear side, which is adapted to face said post, said guide rail being provided with a rack-shaped locking means;

the strap return element comprising a first substantially planar portion and a second portion which is angularly offset relative to said first portion in a direction away from said front side of said guide rail; said first portion having two lateral wings extending toward said guide rail and located on each side of the latter, said first portion also comprising a blocking plate located between said wings and extending oppositely to said guide rail rear side and downwardly inclined toward the latter to cooperate with said rack-shaped locking means for locking said strap-return element in position; and

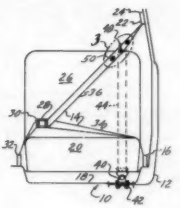
elastic means, located between said blocking plate and said rail rear side and facing said first planar portion, for biasing said strap-return element so that, normally, said first planar portion bears against said rail front side and said blocking plate rests in contact, and in engagement, with said rack-shaped locking means, whereby, when said second portion is pushed in the direction of said rail front side against said elastic means bias, the strap-return element tilts about a junction of said first and second portion so that said first planar portion rotates away from said rail front side and so that said blocking plate is pivotally released from said rack-shaped locking means, thereby allowing shifting of said strap-return element along said guide rail.

4,840,404

SEAT BELT SYSTEM HAVING SHOULDER HEIGHT SUPPORT

Wesley E. Falterman, 40565½ E. Stetson Ave., Hemet, Calif. 92344

Filed Jul. 28, 1988, Ser. No. 225,163
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—808 **17 Claims**



1. A seat belt apparatus for a vehicle having lower anchor means at first and second sides of a seat of the vehicle, and an upper anchor means at the first side of the seat above and behind a back of the seat, the apparatus comprising:

(a) a first belt anchored to the anchor means at the first side of the seat and retractably anchored to the upper anchor means;

(b) coupling means connected to the lower anchor means at the second side of the seat;

(c) buckle means on the first belt, the buckle means being adapted for releasable engagement with the latch means;

(d) rear anchor means below and behind the seat;

(e) a second belt anchored to the rear anchor means and having a free end; and

(f) means for releasably connecting the free end of the second belt to the first belt between the buckle means and the upper anchor means with the second belt in supportive contact with the top of the seat back.

4,840,405

MECHANISM FOR MAINTAINING A STRAP OF A SAFETY BELT IN AN ADJUSTABLE POSITION

Girard Escaravage, Valentigney, France, assignor to Eica-Equipements et Composants Pour L'Industrie Automobile, Audincourt, France

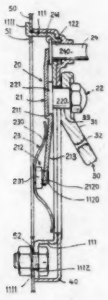
Filed May 25, 1988, Ser. No. 198,349
Claims priority, application France, May 27, 1987, 87 07506
Int. Cl.[4] B60R *22/20*
U.S. Cl. 280—808 **12 Claims**

1. A mechanism for maintaining a strap of a safety belt in an adjustable position for fixing to a structure, and comprising a case, a lock and a strap holder; wherein

said case comprises: a periphery with an anchoring base; and a front wall which is provided with a longitudinal slot having at least one closed end and with a guide located on the longitudinal axis of said slot in the vicinity of said closed end thereof; and

said lock comprises: a push-member having a first end, accessible from the exterior of said case, and a second end located inside the latter and mounted in said guide to be movable in a direction substantially perpendicular to said front wall; a keeper located in said case and articulated to the latter to be tiltable relative to said front wall between a first retaining position, where it is close to said front wall, and a second releasing position where it is away from said front wall and cooperating with said second end

of said push-member; a catch slidingly engaged in said slot and having an outer end, associated with said strap holder, and an inner end located in said case for cooperation with said keeper; and a spring located in said case and acting on said keeper for biasing the latter in its first position in a



direction toward said second end of said push-member and the front wall of the case; whereby, when said first end of said push member is pushed, said keeper is pivoted from its first position to its second position so that it is allowed to release said inner end of said catch.

4,840,406

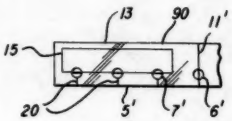
METHOD OF MOUNTING INDEX TABS UPON STENOGRAPHIC NOTEBOOKS

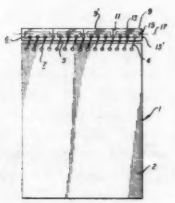
Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed May 29, 1987, Ser. No. 55,406

Int. Cl.[4] B42D *13/00, 1/00*

U.S. Cl. 281—1 **20 Claims**





1. Method of mounting index tabs to coiled wire stenographic notebooks, comprising the steps of:

(a) providing a stenographic notebook having a coiled wire binding means;

(b) providing one or more elongated transparent plastic index tab containing envelopes having a longitudinal axis along the length thereof, and a plurality of aligned apertures therethrough extending along first envelope portions parallel to said longitudinal axis and adjacent a lower envelope edge, at least some of said apertures surrounding turns of said coiled wire, said envelopes also having two open side portions transverse to said longitudinal axis, and upper closed envelope edge portions parallel to said longitudinal axis; and

(c) inserting index tabs through said open side portions of said envelopes until said tabs are contained within said envelopes.

4,840,407

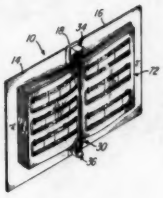
SHEET MUSIC BINDER

Karl S. Schroeder, 6822 Salem Ave., Clayton, Ohio 45315

Filed Mar. 31, 1988, Ser. No. 175,930

Int. Cl.[4] B47D *17/00;* **B42F** *1/00;* **A47B** *19/10, 23/06*

U.S. Cl. 281—48 **13 Claims**



1. A binder for sheet music comprising:

a folder of the type having hinged front and rear panels and a centerline extending from the top to the bottom thereof;

a center post assembly;

means mounting said center post assembly for rotation relative to said folder about an axis parallel to said centerline and spaced inwardly of said panels; and

means for holding sheet music on said center post assembly.

4,840,408

HOSE INTERMEDIATE RETAINER

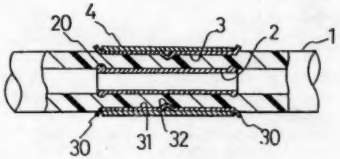
Hiroyuki Nishiki, Nagoya, and Yuji Kokuryu, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 13, 1987, Ser. No. 107,429

Claims priority, application Japan, Oct. 15, 1986, 61-157837[U]

Int. Cl.[4] F16L *5/00*

U.S. Cl. 285—62 **3 Claims**



1. A hose intermediate retainer comprising:

a hose;

an intermediate retainer having: an inner cylinder placed in said hose; and an outer cylinder covering said hose at a location corresponding to the location of said inner cylinder and being pressed in the radial direction inwardly for holding said hose between itself and said inner cyliinder; and

a clamp secured to the outside of said outer cylinder;

wherein said outer cylinder comprises: a first pressed portion having a smooth surface pressed circularly in the radial direction inwardly except both ends of said outer cylinder; and at least one second pressed portion formed

on the portion of said first pressed portion for depressing the outer surface of said hose;

said inner cylinder has a ring shaped projection at both ends having an outside diameter larger than the outside diameter of the central portion thereof; and

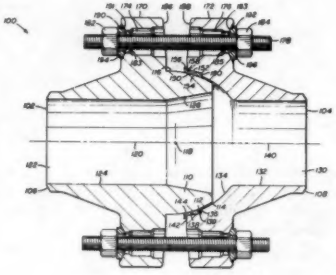
said clamp is secured around said first pressed portion of said outer cylinder and the axial movement of said clamp is restricted by said both ends of said outer cylinder.

4,840,409

SWIVEL FLOW LINE CONNECTOR

Joseph J. Welkey, Houston, Tex., assignor to Taper-Lok Corporation, Houston, Tex.

Filed May 5, 1988, Ser. No. 192,330
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—167 **41 Claims**



1. Apparatus for making a swiveled flow line connection, comprising:

a male member having an annular end portion with a convex curved exterior sealing surface, a maximum outside diameter and a terminus adjacent a minimum outside diameter of said surface;

a female member generally matingly pivotable with said male member and having an annular end portion with an outwardly tapered frustoconical interior surface with a slope with respect to a longitudinal axis of said female member less than that of said male member end portion exterior surface, said frustoconical interior surface terminating at a maximum inside diameter thereof and extending axially to a radially inwardly projecting shoulder at a minimum inside diameter;

a seal ring having a frustoconical outer surface with a slope substantially equal to that of said female member interior surface for sealing engagement therewith, an inner concave annular surface with a curvature substantially equal to that of said male member exterior surface for sealing engagement therewith, a lip extending radially outwardly from said seal ring outer surface adjacent a maximum outside diameter thereof, said seal ring outer surface maximum outside diameter being greater than said female member end portion interior surface maximum inside diameter, and a maximum inside diameter of said seal ring inner surface less than said male member end portion exterior surface maximum outside diameter, said seal ring having an annular face extending radially outwardly from said seal ring inner surface minimum inside diameter to said seal ring outer surface minimum outside diameter, said seal ring annular face having a radial dimension at least as large as that of said radially inwardly projecting female member end portion shoulder; and

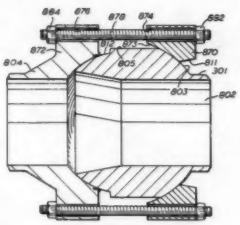
means for urging said male and female members toward each other in pivoted alignment to compress said seal ring between said respective male and female end portion surfaces to form a fluid seal there-between.

4,840,410

APPARATUS FOR MAKING A SWIVELED FLOW LINE CONNECTION

Joseph J. Welkey, P.O. Box 40082, Houston, Tex. 77240

Continuation-in-part of Ser. No. 192,330, May 5, 1988. This application May 24, 1988, Ser. No. 198,126
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—261 **27 Claims**



1. Apparatus for making a swiveled flow line connection, comprising:

a male member having an annular end portion with a convex curved exterior sealing surface with a maximum outside diameter, a terminus adjacent a minimum outside diameter of said surface, and a rearward external convex shoulder;

a female member generally matingly pivotable with said male member and having an annular end portion with an outwardly tapered frustoconical interior surface with a slope with respect to a longitudinal axis of said female member less than that of said male member end portion exterior surface, said frustoconical interior surface terminating at a maximum inside diameter thereof and extending axially to a radially inwardly projecting shoulder at a minimum inside diameter;

a seal ring having a frustoconical outer surface with a slope substantially equal to that of said female member interior surface for sealing engagement therewith, an inner concave annular surface with a curvature substantially equal to that of said male member exterior surface for sealing engagement therewith, a lip extending radially outwardly from said seal ring outer surface adjacent a maximum outside diameter thereof, said seal ring outer surface maximum outside diameter being greater than said female member end portion interior surface maximum inside diameter, and a maximum inside diameter of said seal ring inner surface less than said male member end portion exterior surface maximum outside diameter, said seal ring having an annular face extending radially outwardly from said seal ring inner surface minimum inside diameter to said seal ring outer surface minimum outside diameter, said seal ring annular face having a radial dimension at least as large as that of said radially inwardly projecting female member end portion shoulder; and

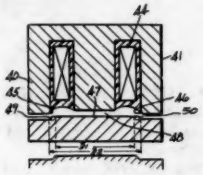
means for urging said male and female members toward each other in pivoted alignment to compress said seal ring between said respective male and female end portion surfaces to form a fluid seal therebetween, said urging means including opposed annular flanges operatively associated with said respective male and female members, said male member flange having a concave surface for engaging said convex rearward external shoulder and pivoting said male member with respect to said male member flange.

4,840,411

ELECTROMAGNETIC SHEAR LOCK

Alan C. Sowersby, Wallingford, Conn., assignor to Harrow Products, Inc., Wallingford, Conn.

Filed Feb. 13, 1987, Ser. No. 14,831
Int. Cl.[4] E05C 17/16
U.S. Cl. 292—251.5 7 Claims



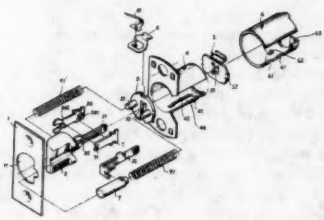
1. A magnetic shear lock of the type comprising one of an electromagnet and an armature for locking a door to a door opening where the door opening is defined by a frame and the door is vertically hinged to said frame for horizontal swinging motion, an electromagnet mounted in the door opening, said electromagnet comprising an E-shaped core having two outer legs and an intermediate leg, all of said legs extending vertically from a common base, an energizing coil wound about said intermediate leg between said outer legs, an armature member adapted to be mounted in the door for vertical movement toward said electromagnet when said coil is energized, said armature having a central elongated longitudinal projection on its surface facing said electromagnet and integral with said armature, the edges of said projection being inwardly beveled ten to thirty-five degrees, the outer legs of said electromagnet having surfaces arranged to make surface contact with said armature on either side of said projection when said coil is energized, said outer legs of said electromagnet having outwardly beveled edges on the inner sides thereof of ten to thirty-five degrees arranged to make contact with the beveled edges of said armature projection, said intermediate leg of said electromagnet being of lesser dimension than said outer legs to define a recess between said outer legs for said armature projection, said projection of said armature being received between said outer legs of said electromagnet when said coil is energized and providing a mechanical resistance to shearing movement between said electromagnet and said armature when said coil is energized.

4,840,412

EASILY ADJUSTABLE LATCH

Richard Shen, No. 233, Sec. 2, Hai Tien Road, Tainan, Taiwan

Filed Aug. 11, 1987, Ser. No. 83,823
Int. Cl.[4] E05C 1/16
U.S. Cl. 292—337 1 Claim



1. An easily adjustable variable backset latch comprising:

(A) a substantially cylindrical inner housing (4) with a U-shaped guide slot (42) and a protuberance (41) thereon; said protuberance (41) projecting radially outwards from a central point of a cut out section (44) formed by said guide slot (42); said inner housing (4) also having a plate portion on a foremost end thereof which is fixed to a faceplate (1);

(B) a main bolt (2) having a slide extension (21) projecting rearwardly from a rear end thereof; said slide extension (21) having an extension slot (22) set horizontally along a center axis thereof; a link (24) being on a first side of said extension slot (22) and being slidably secured thereto by means of a punchout (241) and a stop (242); a slide bar (7) being on a second side of said extension slot (22), said slide bar (7) being slidably retained in said extension slot (22) by a catch (71), and said catch (71) being slidable between said stop (242) and said punchout (241), said slide bar (7) being urgeable by a spindle of a doorknob handle to retract said slide extension (21) and said main bolt (2) when said variable backset latch is in maximum backset position;

(C) an auxiliary bolt (9) which is secured to and urgeable by an L-shaped actuating plate (23);

(D) a retainer plate (3) with two retainer posts (31) thereon; said retainer plate (3) being retained by a circular retention wall (43) of said inner housing (4); said two retainer posts (31) respectively receiving springs (91, 91') thereon for providing a restoring force for the main bolt (2) and the auxiliary bolt (9), respectively; a bent O-shaped stabilizer (8) having two recesses at one end thereof to engage with and secure the retainer plate (3) and having a protrusion on another end thereof, said stabilizer (8) preventing said auxiliary bolt (9) from being forced open; a flat spring (81) with a hole on a first end thereof for receiving said protrusion on said stabilizer (8) so as to vertically secure said stabilizer (8), with a second end of said stabilizer (8) contacting an inner wall of said inner housing (4); and

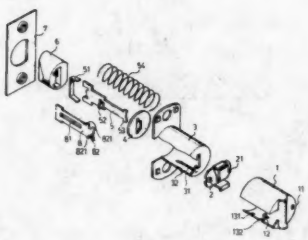
(E) a substantially cylindrical outer housing (6) having a guide piece (62) for engaging with said guide slot (42); said outer housing (6) also having a minimum backset hole (61) and a maximum backset hole (61'); said protuberance (41) being engageable with either of said backset holes (61 or 61').

4,840,413

LENGTH-ADJUSTABLE LATCH

Richard Shen, No. 233, Sec. 2, Hai Tien Road, Tainan, Taiwan

Filed Aug. 14, 1987, Ser. No. 85,620
Int. Cl.[4] E05C 1/16
U.S. Cl. 292—337 1 Claim



1. A length-adjustable latch comprising:

an outer housing (1) having an inwardly-extending protuberance (12) and having two longitudinally spaced holes (131,132) thereon;

an inner housing (3) having a longitudinal slot (31) to engage with said protuberance (12) and having an extension block (32) engageable with said positioned holes (131, 132), a circular slidable plate (4) being inserted thereinto;

an installation seat (2) being secured to said outer housing (1) by engaging two blocks (21) thereof with respective corresponding holes (11) disposed at said outer housing (1);

a drive linkage (5) having an extension element (52) extend-

ing from middle portion thereof; said drive linkage (5) being stepped at one end thereof to form a larger end and a smaller end; said larger end being connected to a U-shaped clip (51) and together inserted into a bolt (6); said smaller end being formed with an extension (53);

a backset plate (8) having a longitudinal sliding space (81) to slidably receive said extension element (52) of said drive linkage (5); said extension element (52) having a front end with a width slightly larger a width of said sliding space (81) to prevent said extension element (52) from sliding out of said sliding space (81); said backset plate (8) having a trail end (82) and a laterally protruding portion (821) on a rear end thereof;

a spring (54) encompassing said drive linkage (5) and said backset plate (8) being utilized to facilitate the operation of said bolt (6);

characterized in that:

said outer housing (1) is longitudinally slidable and adjustable relative to said inner housing (3) by positioning said longitudinally-spaced holes (131, 132) with said extension block (32);

said outer housing (1), said installation seat (21), said inner housing (3) and said slidable plate (4) each have respective openings provided on corresponding positions thereof respectively; said extension (53) of said drive linkage (5) extends through said openings provided respectively on the slidable plate (4), the inner housing (3) and the installation seat (2), the protruding portion (821) of the backset plate (8) is blocked out of the outer housing (1) by the installation seat (2);

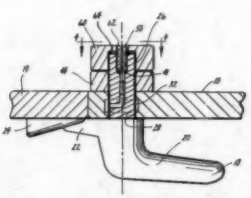
said trail end (82) and said laterally protruding portion (821) of the backset plate (8) extend out of the installation seat (2), only said backset plate (8) is usable for drawing back said bolt (6) when said outer housing (1) is in a 70 mm backset position; said drive linkage (5) is utilized for drawing back said bolt (6) when said outer housing (1) is in a 60 mm backset position.

4,840,414

GREASE FITTING FOR DOG

Keith L. Ford, 4327 Woodward, Wayne, Mich. 48189

Filed Feb. 29, 1988, Ser. No. 161,953
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—356 **5 Claims**



1. A dog useful for latching a ship's door to a bulkhead, having an opening communicating with a lubricant-receiving cavity comprising:

a handle having a spindle received through said opening such that a first handle portion is slideably disposed in said opening, the spindle having external threaded means and a lubricant passage with an inlet opening in an extreme end of the spindle, and an outlet opening adjacent the lubricant-receiving cavity;

the inlet opening of the lubricant passage having internal threaded means;

an elongated plug threadably received in the inlet opening, and abutment means in the spindle engageable with the plug such that when fully seated in the spindle inlet opening, the outer end of the plug extends beyond the spindle a sufficient distance for a tool to clampingly engage the plug;

a first nut mounted on the external, threaded means of the spindle so as to abut the bulkhead on the side opposite the handle; and

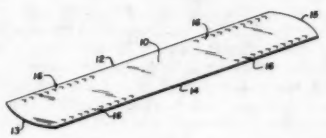
a cap nut mounted on the spindle adjacent the first nut to substantially enclose the end of the spindle, the cap nut having an opening for generally enclosing the outer end of the plug.

4,840,415

APPARATUS TO MOVE NEGATIVES

Ralph E. Baker, Vancouver, and Gordon G. Landherr, Surrey, both of Canada, assignors to Ampro Photo Workshops Limited, Vancouver, Canada

Filed Feb. 29, 1988, Ser. No. 161,729
Int. Cl.[4] B25B *27/00*
U.S. Cl. 294—1.1 **4 Claims**



1. An apparatus for moving a longitudinal film strip carrying positive or negative images having spaced perforations along parallel longitudinal edges of the strip in a longitudinal pocket comprising:

a longitudinal planar member having first and second parallel longitudinal edges and a plurality of spaced, flexible gripping means extending out of the plane of the longitudinal member for engagement in the spaced perforations along parallel edges of a film strip when said planar member is positioned adjacent a film strip in an overlying manner within a longitudinal pocket holding said film strip.

4,840,416

SYSTEM COMPRISING A POWER-ACTUATED GRIPPER AND A NUMBER OF GRIPPING OBJECTS, ESPECIALLY FOR USE IN AN AUTOMATED FOUNDRY PLANT, WITH FLUID COMMUNICATION BETWEEN SAID GRIPPER AND A GRIPPING OBJECT BEING GRIPPED BY IT

Ole A. Jacobsen, Tisvildeleje, Denmark, assignor to Dansk Industri Syndikat A/S, Herley, Denmark

Filed Oct. 14, 1987, Ser. No. 108,392
Claims priority, application Denmark, Oct. 14, 1986, 4898/86
Int. Cl.[4] B25J *15/06, 9/14*
U.S. Cl. 294—2 **6 Claims**

1. A system comprising

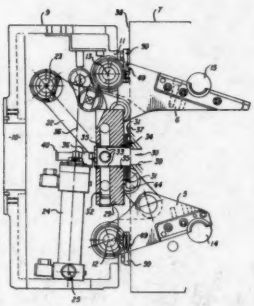
(a) a gripper (3) adapted to be moved between various stations and comprising

(a1) gripping means (5,6,49) adapted when in a gripping position (FIG. 2) to engage cooperating engagement means (14,15,50) on a gripping object (7) and when in a non-gripping position (FIG. 3) to be out of engagement with such cooperating means, and

(a2) fluid-communication coupling means (30,31) adapted when in said gripping position to engage cooperating fluid-transfer means (37,39,48) of said gripping object (7) and when in said non-gripping position to be out of engagement with such cooperating fluid-transfer means, and

(b) a number of gripping objects (7) adapted to be moved between various stations by said gripper (3) and each comprising

(b1) engagement means (14,15,50) adapted to be engaged by said gripping means (5,6,49) on said gripper (3), and
(b2) fluid-transfer means (37,39,48) adapted to be engaged by said fluid-communication coupling means (30,31) on said gripper (3),
characterized in
(c) that said fluid-communication coupling means (30,31) on said gripper (3) for providing fluid-communication between said gripper means and said gripping objects are constituted by tubular members with at least one open



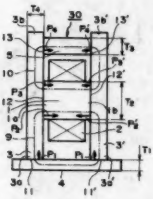
end, said open ends being adapted to be brought into fluid-tight contact with a substantially plane surface (37) on said gripping object (7) by movement of said gripping means from the non-gripping position to the gripping position, said substantially plane surface (37) comprising fluid-transfer openings (39,48) adapted such that when said gripping object is in said gripping position said fluid transfer openings are situated within the limits of the positions of said open ends of said fluid-communication coupling means defined only by engagement of said gripping object by said gripping means.

4,840,417

MOVABLE YOKE-TYPE LIFTING MAGNET DEVICE

Akira Izumi; Tomomi Kishi, both of Toyota, and Hideo Niwa, Toyoake, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Sanmei Denki Kabushiki Kaisha, Nagoya, both of, Japan

Filed Nov. 27, 1987, Ser. No. 126,006
Claims priority, application Japan, Nov. 27, 1986, 61-280669
Int. Cl.[4] B66C *1/06*; H01F *7/20*
U.S. Cl. 294—65.5 **19 Claims**



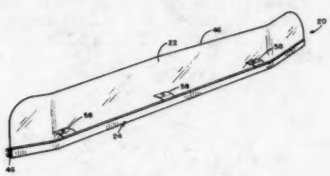
1. A yoke-type lifting magnet device comprising:
a main core constructed of magnetic material and having first and second ends;
a coil wound around said main core;
at least one yoke magnetically coupled to each of said first and second ends of said main core, respectively, each said yoke having a first end adapted to magnetically couple with a workpiece to be lifted and a second end opposite said first end of said yoke with respect to said main core, said main core, said yoke provided at said first end of said main core, said workpiece, and said yoke provided at said second end defining a first magnetic flux path when said main core is magnetically excited; and
an auxiliary core magnetically coupled between said second end of each said yoke, said main core, said yoke provided at said first end of said main core, said auxiliary core, and said yoke provided at said second end of said main core defining a second magnetic flux path when said main core is magnetically excited, wherein said first and second magnetic flux paths are parallel to each other, thereby forming a magnetic flux path circuit.

4,840,418

PROTECTIVE SHIELD AND METHOD OF FASTENING PROTECTIVE SHIELD TO A FRAME

Charles A. Bockenheuser, Tulsa, Okla., assignor to Pardners Unlimited, Inc., Tulsa, Okla.

Continuation of Ser. No. 9,816, Feb. 2, 1987, abandoned. This application Mar. 24, 1988, Ser. No. 177,826
Int. Cl.[4] B60J *1/20*
U.S. Cl. 296—91 **24 Claims**



1. A protective shield assembly, comprising:
a shield having at least one edge;
a frame, the frame including a front wall, a rear wall spaced apart from the front wall, and a bottom; the bottom securely connecting the front wall to the rear wall; the front wall having an inside facing the rear wall and an outside; the rear wall having an inside facing the front wall and an outside; the front wall, rear wall, and bottom forming a channel; and
mechanical fastening means, extending partially across the channel from at least one of the front wall and the rear wall, for adhesive-independently fastening the edge of the shield into the channel, the fastening means mechanically connecting to the surface of the shield in order to prevent extraction of the shield from the channel.

4,840,419

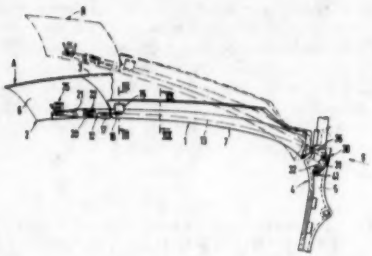
TENSIONING ARRANGEMENT FOR THE TOP COVER OF A MOTOR VEHICLE

Eugen Kolb, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,445
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718093
Int. Cl.[4] B60J *7/12*
U.S. Cl. 296—108 **20 Claims**

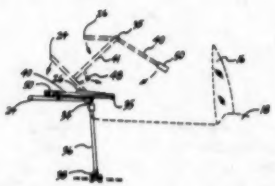
1. A tensioning arrangement for a foldable top cover of a motor vehicle, comprising draw means extending through loop-shaped longitudinal edges of the foldable top cover, said draw means being operatively connected with a forward transversely extending frame means of the foldable top cover by a draw spring and with a rear pivotal support means of the foldable top cover at its other end by a spring-loaded foldable pivot lever means, whereby in a closing position of the foldable top, a pressure bolt means arranged at the pivot lever means is

supported at a free end of a laterally positioned longitudinal extending girder of the foldable top and tensions the draw



spring means by way of the draw means to tension the foldable top cover means of the motor vehicle.

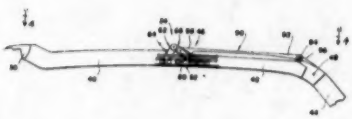
4,840,420
CONVERTIBLE TOP
Darrell A. Weber, 712 9 St, N.E., Minot, N. Dak. 58701
Filed Nov. 6, 1987, Ser. No. 117,327
Int. Cl.[4] B60J *7/12*; B62K *27/16*
U.S. Cl. 296—116 **2 Claims**

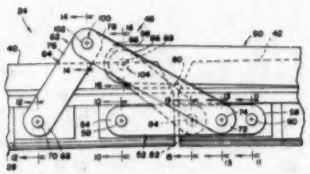


2. A convertible top for motorcycle sidecars, comprising:
a collapsible frame;
said collapsible frame having a pair of spaced vertical supports;
means for mounting said vertical supports on the floor of a sidecar;
a first U-shaped bow pivotally mounted to each of said vertical supports;
a pair of side support rails pivotally mounted on opposite sides of said first U-shaped bow;
a second U-shaped bow pivotally mounted to each of said side support rails;
a pair of front support bars pivotally mounted to said side support rails;
windshield clamp means on each of said front support bars;
a pair of pivotal support braces, each of said support braces having an intermediate pivotal connection, and each of said support braces having one end pivotally mounted on said first U-shaped support bow and having an opposite end pivotally mounted on one of said side support rails; and
foldable cover means over said collapsible frame.

4,840,421
VEHICLE CONVERTIBLE TOP FRAME SIDE RAIL LINKAGE ASSEMBLY
Robert E. Hennessy, Allen Park, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.
Filed Mar. 7, 1988, Ser. No. 164,532
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—122 **13 Claims**

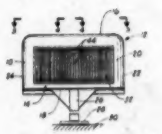
1. In a vehicle convertible top including a frame movable between a raised use position and a folded storage position and having a pair of side rails each of which includes front and intermediate rail members, a linkage assembly associated with each side rail and comprising:
a hinge link having opposite ends respectively pivoted to the front and intermediate rail members;
an operating linkage including first and second operating links having first ends respectively pivoted to the front and intermediate rail members and having second ends including a pivotal connection that pivotally connects these second ends directly to each other;

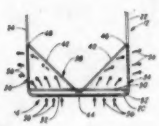




a connecting link that interconnects the hinge link and the operating linkage to coordinate the movements of the hinge link and the operating linkage to move the front and intermediate rail members between an unfolded use position and a folded storage position; and
an actuating member connected to the side rail and to the operating linkage to actuate folding and unfolding movement of the front and intermediate rail members as the convertible top frame is moved between the use and storage positions.

4,840,422
TRAILER AIR GRILL
Thomas H. Engel, 45 Terry Ct., Hollister, Calif. 93502
Filed Jan. 4, 1988, Ser. No. 140,475
Int. Cl.[4] B62D *37/02*
U.S. Cl. 296—180.4 **9 Claims**





1. A trailer air grill adapted for mounting in a front wall, a side wall and an opposite side wall of a trailer, the trailer air grill comprising:
a front wall intake air grill mounted in the front wall, the front wall intake air grill having stationary louvers mounted therein for directing airflow at an angle when air

impacting the front wall intake air grill is received therethrough;

a first side wall discharge air grill mounted in the side wall;

a second side wall discharge air grill mounted in the opposite side wall, the stationary louvers in the front wall intake air grill directing substantially half of the airflow toward the first side wall discharge air grill and the other half of the airflow toward the second side wall discharge air grill; and

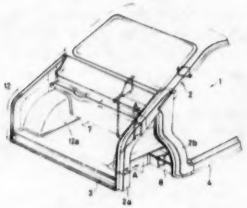
an interior V-shaped deflector barrier centered at the back of the front wall intake air grill to deflect the airflow to the first and second side wall discharge air grills.

4,840,423

FRONT BODY STRUCTURE OF A MOTORCAR

Yoshihiro Maekawa, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 29, 1988, Ser. No. 174,884
Claims priority, application Japan, Mar. 31, 1987, 62-80605
Int. Cl.[4] B62D *21/02*
U.S. Cl. 296—194 **30 Claims**



1. In a cab-over type motor vehicle in which a front seat is mounted on a floor at a position above an engine, a front body structure thereof comprising:

a front cross member extending in the transverse direction of the vehicle body at the fore end thereof;

a pair of side sills extending in the longitudinal direction of the vehicle body along respective sides of said floor;

a pair of front side frames extending substantially horizontally in the longitudinal direction of the vehicle body along respective side portions of said floor, each said front side frame having a front portion extending beyond the front end of the respective said side sill, said front portion being offset inwardly of the remaining portion of said front side frame, and the fore end of said front side frame being connected to said front cross member at a position spaced substantially inwardly from the respective end thereof;

a pair of front pillars extending in the vertical direction of the vehicle body at respective front side portions thereof, the lower portion of each said front pillar being bifurcated in the longitudinal direction of the vehicle body into a fore branch and a rear branch, said fore branch being connected at the lower end thereof to the respective said end of said front cross member, and each said rear branch being connected at the lower end thereof to the respective said side sill; and

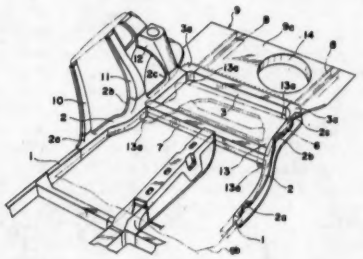
a pair of front tires, each said tire being disposed between said fore and rear branches of a respective said front pillar lower portion.

4,840,424

AUTOMOTIVE REAR UNDERBODY STRUCTURE

Seiichi Asoh, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 31, 1988, Ser. No. 176,179
Claims priority, application Japan, Mar. 31, 1987, 62-80604; Mar. 31, 1987, 62-49307[U]; Apr. 7, 1987, 62-85087
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—204 **17 Claims**



1. An underbody structure of an automotive vehicle, which comprises:

a pair of side sills each having a generally closed cross section and extending longitudinally of the automotive vehicle, said side sills spaced apart from each other in a direction extending widthwise of the automotive vehicle;

a respective rear frame member connected to and butting end-to-end against each one of said side sills and extending rearwardly of the automotive vehicle;

a first cross member connected at its opposite ends to the rear frame members, respectively, so as to extend widthwise of the automotive vehicle in the same plane in which the rear frame members lie; and

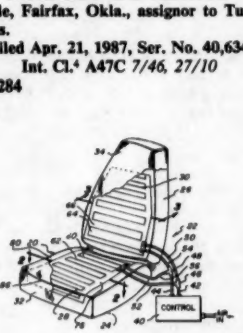
a second cross member connected at its opposite ends to the rear frame members, respectively, so as to extend widthwise of the automotive vehicle in said plane, said second cross member being disposed rearwardly of the first cross member with respect to the automotive vehicle.

4,840,425

VARYING SUPPORT CUSHIONED SEATING ASSEMBLY AND METHOD

Roger H. Noble, Fairfax, Okla., assignor to Tush Cush, Inc., Liberal, Kans.

Filed Apr. 21, 1987, Ser. No. 40,634
Int. Cl.[4] A47C *7/46, 27/10*
U.S. Cl. 297—284 **7 Claims**



1. In a seating device having a seat unit and a back unit, an assembly for providing varying cushioned support to the body of a user seated on said device, said assembly comprising:

first and second sections, said first section having front and rear portions and being positionable adjacent to said seat

unit of said seating device, and said second section having upper and lower portions and being positionable adjacent to said back unit of said seating device, each of said portions of said first and second sections including a plurality of adjacently positioned support members each of which has a support surface with said support surfaces being positionable to support different areas of the body of a user when seated on said seating device, and at least selected ones of said plurality of support members of said portions of said first and second sections including movement establishing means for causing movement of said support surfaces of said selected ones of said plurality of support members relative to adjacent support surfaces of the others of said plurality of said support members with movement of at least some of said support surfaces of said selected ones of said plurality of support members in said rear portion of said first section and said lower portion of said second section occurring prior to movement of said support surfaces of said selected ones of said plurality of support members in said front portion of said first section and said upper portion of said second section and with at least one of said selected ones of said plurality of support members adjacent to said lower portion of said second section being configured so that said support surface of said at least one of said selected ones of said plurality of support members adjacent to said lower portion of said second section is movable a greater distance toward a user seated in said seating device than said support surfaces of others of said plurality of support members whereby support is provided to the lumbar region of the spine of a user seated on said device, and each of said first and second sections including input means and transmitting means connected between said movement establishing means and said input means, with said input means of said first section being positioned in said rear portion of said first section and said input means of said second section being positioned in said lower portion of said second section; and

control means connected with said input means of both of said first and second sections for periodically causing movement of said movement establishing means to thereby vary the areas of support provided to the body of a user when seated on said seating device and to cause massaging action by said support surface of said at least one of said selected ones of said plurality of support members adjacent to said lower portion of said second section to thereby relieve discomfort at said lumbar region of the spine of a user seated on said device.

4,840,426

OFFICE CHAIR

Burkhard Vogtherr, Kandern-Holzen, and Manfred Elzenbeck, Steinheim/Murr, both of Fed. Rep. of Germany, assignors to Davis Furniture Industries, Inc., High Point, N.C.

Filed Sep. 30, 1987, Ser. No. 102,724

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—300 **12 Claims**

1. An office chair comprising:

(a) a seat member and a backrest member having a lumbar region, said seat member and backrest member hingedly articulated together about a first horizontal axis extending along the rear of said seat member and the lower edge of said backrest member, said backrest member being curved from top to bottom about a second horizontal axis extending through said lumbar region;

(b) a support system including:

(i) a vertical column extending upwardly from a base and a support frame having a transverse support arm;

(ii) said transverse support arm mounted on the upper end of and extending perpendicularly from said vertical column, said transverse support arm extending beneath said seat member along a third horizontal axis;

(iii) said support frame further including a front member and a longitudinal member extending forwardly from said transverse support arm;

(c) a pair of side arms, each side arm affixed to an opposite end of said transverse support arm and extending upwardly then rearwardly therefrom, the upper end of each side arm pivotally supporting opposite side edges of said backrest member at a point substantially aligned with said second horizontal axis;

(d) spaced slotted housing secured to the undersurface of said seat member adjacent the front portion thereof;

(e) connecting means slidably joining and selectively locking said front member of said support frame within said spaced slotted housings;

(f) the second horizontal axis extending through said lumbar region lying rearwardly of said transverse support arm, said first horizontal axis being movable responsive to tilting of said backrest member between a first upright position in which said first horizontal axis is positioned substantially rearwardly of said second horizontal axis and a second tilted position in which said first horizontal axis is positioned substantially beneath said second horizontal axis;

(g) whereby as said back member is tilted rearwardly said seat member realizes a slight lowering and the horizontal distance between the center of gravity of the occupied chair and said transverse support arm is minimized.

4,840,427

SEAT FOR AN AUTOMOBILE

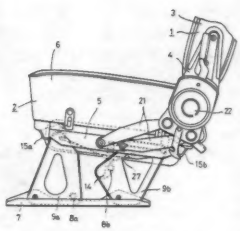
Bahk Hong, Seoul, Rep. of Korea, assignor to Kia Motors Corporation, Rep. of Korea

Filed Aug. 13, 1987, Ser. No. 85,990

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—346 **12 Claims**



1. An adjustable seat for a vehicle comprising:

a seat back;

a seat bottom;

the seat back being coupled to a device for adjusting the forward or backward position of the adjustable seat;

means for adjusting the angle of the seat back to the seat bottom, the means for adjusting being coupled to the seat back; and

the seat bottom including means for moving the seat bottom forwards and backwards and adjusting the angle of the seat bottom with respect to a floor of the vehicle, the means for moving the seat bottom forward and backward including a pair of side brackets secured to a bottom of the seat bottom, a pair of seat support brackets secured to a floor of the vehicle, and two sets of legs, each set of legs including a pair of legs that are pivotally connected to a separate side bracket and support bracket, the legs being pivotal from a first position to a second position, at least one pair of lgs including a pin on each of the legs, the seat bottom further including means for removably securing the legs in the first or second position, the means for removably securing including at least one handle secured to a connecting member, the connecting member being secured to a locking member for receiving a pin on the legs, the locking member being coupled to a spring so as to be biased against the pin, the handle cooperating with the connecting member to cause the locking member to release the pin.

4,840,428

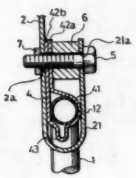
HEAD REST ADJUSTING DEVICE

Hideo Kobayashi, and Yoshio Arai, both of Akishima, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,222

Int. Cl.[4] A47C 7/36

U.S. Cl. 297—408 **11 Claims**



1. A head rest adjusting device in which the head rest is adjustably inclined forwardly and backwardly relative to a head rest stay, comprising:

a head rest frame;

a friction mechansim including at least one substantially U-shaped leaf spring made of metallic material, said leaf spring being wound about the head rest stay and comprising a securing section, a stay receiving section adapted for receiving therein of said head rest stay, and a protruding resilient section integrally formed on said stay receiving section, said protruding resilient section being adapted to provide a resiliency to said stay receiving section; and

means for securing said friction mechanism to said head rest frame.

4,840,429

MOTOR-ADJUSTABLE HEAD SUPPORT FOR A DENTAL TREATMENT CHAIR

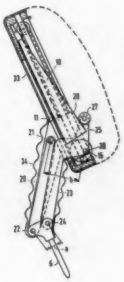
Klaus Stöckl, Bensheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 21, 1988, Ser. No. 222,516

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727204

Int. Cl.[4] A47C 7/38

U.S. Cl. 297—409 **17 Claims**



1. A reclining chair having a back rest, a head support with a housing and adjustment means for positioning the head support relative to the back rest, said adjustment means having a guideway rigidly mounted in the housing, a straight-line moving mechanism having a fixed part receiving a movable part, said mechanism being disposed in said housing, drive means being positioned in the housing for moving the movable part along said fixed part, two supporting arms each having a first pivotable connection at one end to a second part on said back rest and at the other end having a second pivotable connection to the movable part, said second pivotable connections on the movable part being spaced apart by a distance greater than a distance between the first pivotable connections to form a quadrilateral linkage and one of the two arms having a roller engaging said guideway so that when the movable part is shifted on the fixed part, a point on the head support moves in a predetermined curve having a center offset from the pivotable connections and said back rest.

4,840,430

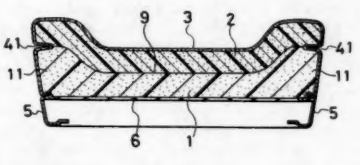
AUTOMOTIVE SEAT AND METHOD OF FORMING SAME

Makoto Shimada, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1988, Ser. No. 143,222

Int. Cl.[4] A47C 7/02

U.S. Cl. 297—452 **8 Claims**



1. An automotive seat comprising:

a foam main pad which is so foamed in a mold that a central portion of its upper surface is recessed;

a sub pad bonded to said main pad such that said sub pad conforms in shape to said upper surface of said main pad,

wherein said sub pad is also bonded to a covering member; and

a decorative recessed groove provided between said main pad and said sub pad such that it is defined laterally of said main and sub pads;

wherein said sub pad is formed into an uneven shape, so that the size of said sub pad is conformed to that of said main pad, the free end part of said covering member being inserted into a boundary between said sub pad and said main pad.

4,840,431

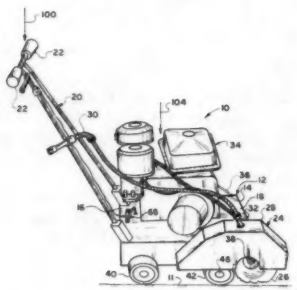
PORTABLE ROTARY POWER SAW

Andrew L. Jedick, Sheffield, Ohio, assignor to Diamond Products, Inc., Elyria, Ohio

Filed Jul. 26, 1988, Ser. No. 224,452

Int. Cl.[4] E21C *47/00*

U.S. Cl. 299—39 **13 Claims**



1. A portable rotary power saw for cutting a groove into concrete, asphalt or similar surfaces comprising a housing having a fore end and an aft end, said housing at its aft end having one or more rear wheels supporting said aft end upon such surface and a handlebar assembly extending vertically upward therefrom, said housing at its fore end supporting a rotary cutting blade, a vertically adjustable axle in the proximity of said fore end including one or more front wheels, a stationary axle mounted on said housing between said aft end and said fore end, said adjustable axle being supported by said stationary axle, and adjustment means for adjusting the position of said adjustable axle relative to said housing and in turn the vertical height of said fore end of said housing and thus the cutting depth of said blade, said adjustment means comprising a segment, a latch, and actuation means for operating said latch, said segment having a first leg supported by said stationary axle and a second leg having a plurality of notches spaced along its length and extending through the top of said housing, said latch being located immediately adjacent said notched second leg and being capable of pivoting in and out of engagement with said notches, said segment being connected to said adjustable axle and being biased by a biasing means such that when a user activates said actuation means and exerts a verticaliy downward force upon said handlebar assembly causing said housing to pivot upon said rear wheels said adjustable axle extends vertically downward relative to said housing and when said user discontinues activating said actuation means said latch engages one of said notches of said second leg of said segment thereby locking said segment and said adjustable axle into a predetermined position.

4,840,432

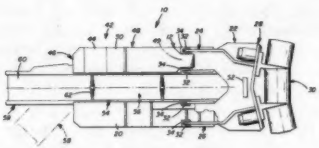
CONTINUOUS MINER WITH DUCT ASSEMBLY

Maurice K. LeBegue, and Henry E. Wilson, both of Fairmont, W. Va., assignors to Baker International Corporation, Orange, Calif.

Filed Jul. 21, 1987, Ser. No. 76,155

Int. Cl.[4] E21C *35/22*

U.S. Cl. 299—64 **13 Claims**



1. A continuous miner comprising

a mobile frame assembly having a front end portion and a rear end portion,

a boom assembly extending from said mobile frame assembly,

said boom assembly having a first end portion pivotally connected to said mobile frame assembly by a plurality of connecting means and a second end portion spaced from said first end portion,

dislodging means connected to said boom assembly second end portion,

conveying means connected to said mobile frame assembly for receiving material from said dislodging means,

four individual retaining means secured to said mobile frame assembly front end portion, each said retaining means secured to said mobile frame assembly at a predetermined location along an axis transverse to a longitudinal axis of said mobile frame assembly, and

four individual engaging means extending longitudinally from said boom assembly first end portion, each said engaging means pivotally connected by a pivot pin to one of said retaining means to allow said boom assembly to pivot in an upward and downward direction relative to said mobile frame assembly.

4,840,433

PRESSURE CONTROL DEVICE, IN PARTICULAR FOR PRESSURE-FLUID-OPERABLE BRAKE SYSTEMS OF AUTOMOTIVE VEHICLES

Juergen Schonlau, Walluf; Alfred Birkenbach, Hattersheim, and Ralf Harth, Oberursel, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 17, 1988, Ser. No. 169,562

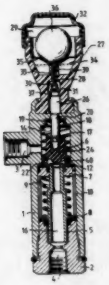
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709991

Int. Cl.[4] B60T *8/24, 8/26, 8/28;* G05D *16/10*

U.S. Cl. 303—9.68 **5 Claims**

1. A pressure control device for pressure-fluid-operable brake systems of automotive vehicles, comprising a housing having a longitudinal axis extending in a vertical direction and said housing incorporating a pressure control valve adapted to control pressure fluid flow between a pressure-fluid inlet and a pressure-fluid outlet of said housing, a deceleration-responsively movable inertia member in said housing, a control piston arranged in the housing, said control piston being slidable in dependence upon the pressure of the pressure fluid and the position of the inertia member, said control piston operatively connected to the pressure control valve, wherein the inertia member is provided in a chamber in the housing, said chamber being substantially free from pressure fluid, a guide element in said chamber for guiding said inertia member in a horizontal movement direction in response to deceleration forces on said inertia member the inertia member adapted to control a second

valve which is mounted and operative to isolate a compartment, confined by the housing and a face of the control piston, from the chamber, said second valve connecting said chamber and said compartment wherein the record valve closes the



connection between said chamber and said compartment when said inertia member is moved into said horizontal direction thereby to constrain said control piston to a fixed position relative to said compartment.

4,840,434

VEHICLE BRAKE SYSTEM HAVING AN ANTI-SKID APPARATUS

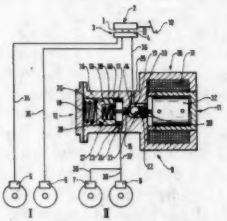
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,453

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431326

Int. Cl.[4] B60T *8/26*

U.S. Cl. 303—113 **5 Claims**



1. A vehicle brake system comprising a brake fluid pressure means for applying a brake pressure in said brake system, front wheel brakes, rear wheel brakes, and an antiskid apparatus between said brake fluid pressure means which controls fluid flow from master cylinder to said rear wheel brakes, a brake pressure regulating valve and one brake pressure maintenance valve disposed between said brake fluid pressure means and the rear wheel brakes, said brake pressure regulating valve and said brake pressure maintenance valve are united into a valve combination and have a hydraulically self-controlling rear wheel brake pressure limiter, a first valve seat and a first movable valve element, said first movable valve element is actuatable on one end by an adjusting piston and on the other end by an electromagnet of said brake pressure maintenance valve.

4,840,435

HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES WITH ANTI-SKID CONTROL SYSTEM

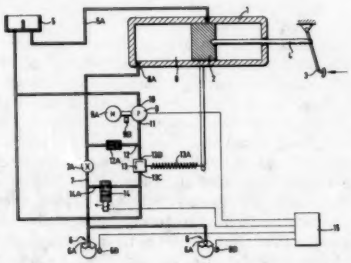
Helmut Steffes, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 252,288

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734603

Int. Cl.[4] B60T *8/40*

U.S. Cl. 303—116 **3 Claims**



1. A hydraulic brake system for automotive vehicles with an anti-skid control system, having a master brake cylinder with a master piston and a working chamber disposed therein, a first conduit, a wheel brake cylinder connected to said master brake cylinder through said first conduit, a pressure medium storage reservoir connected to said first conduit, control valves connected between said first conduit and said reservoir, a hydraulic pump, operable through a motor, actuable via an electronic booster-and-control unit, the outlet of which is coupled via a non-return valve to said first conduit and the inlet of which is coupled to said reservoir, wherein the improvement comprises:

said first conduit being open between said master brake cylinder and said wheel brake cylinder;

a pressure control valve actuable in response to the volume of said working chamber;

the inlet of said non-return valve communicating with the outlet of said hydraulic pump and the inlet of said pressure control valve;

means communicating the outlet of said pressure control valve with said pressure medium storage reservoir;

a valve in communication with said first conduit between said master brake cylinder and said wheel brake cylinder and controlled via said electronic booster-and-control unit to open and close to bring said first conduit into communication with said pressure medium storage reservoir; and

a section of reduced cross-sectional area in said first conduit between said valve and said working chamber, said cross section being smaller than the cross section of said first conduit between said valve and said wheel brake cylinder.

4,840,436
ANTI-LOCK BRAKE SYSTEM WITH TRACTION SLIP CONTROL

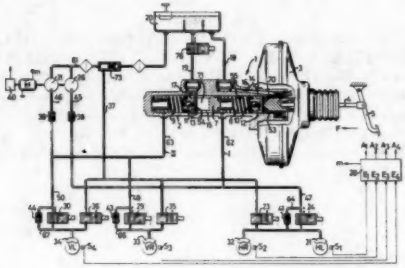
Jochen Burgdorf, Rumpenheim; Hans-Dieter Reinartz, Frankfurt am Main; Lutz Weise, Pfungstadt; Norbert Ocvirk, Offenbach; Horst P. Becker, Frankfurt am Main, and Otto Determann, Darmstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,310

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635846

Int. Cl.[4] B60T *8/32;* **B60K** *28/16*

U.S. Cl. 303—119 **9 Claims**



9. An anti-lock brake system with traction slip control of the type including a pedal-actuated, auxiliary-force-assisted braking pressure generator having a master cylinder to which two break circuits each including a pair of wheel brakes are connected by two main brake lines, at least one auxiliary-pressure hydraulic pump, wheel sensor means and electronic circuit means for determining rotational behavior of the wheels and for generating electric braking-pressure control signals which, for the purpose of slip control, control an electromagnetically actuatable pressure-fluid inlet valve and outlet valve provided in the pressure-fluid lines, pistons of the master cylinder being provided with central control valves which, in a brake release position, open pressure-fluid connections between a pressure-fluid supply reservoir and pressure chambers of the master cylinder and which, in a braking position, close said pressure-fluid connections, said at leaslt one hydraulic pump connected to the supply reservoir and to the main brake lines, and comprising at least one valve provided in a pressure-fluid conduit leading from the pressure-fluid supply reservoir to the master cylinder, said at least one valve adapted to shut off pressure-fluid flow in said conduit in the event of traction control, whereby auxiliary pressure develops in said two brake circuits, including a throttling valve in one of the main brake lines which is connected to one of said pressure chambers of the master cylinder which includes a floating piston, said throttling valve adapted to preclude displacement of said floating piston in an actuating direction during traction control.

4,840,437
DYNAMIC TRACK TENSIONING SYSTEM FOR TRACKED VEHICLES

Samuel B. Henry, Royal Oak, and James J. Kuhns, Romeo, both of Mich., assignors to Cadillac Gage Textron Inc., Warren, Mich.

Filed Mar. 15, 1988, Ser. No. 168,382

Int. Cl.[4] B62D *55/30*

U.S. Cl. 305—10 **11 Claims**

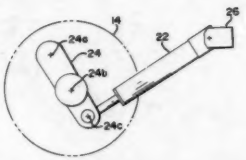
1. In tracked vehicle having tracks subject to variable tension, a dynamic track tension system comprising:

a source of hydraulic pressure;

condition detecting means for detecting vehicle conditions for and producing control signals in accordance with the vehicle conditions;

hydraulic control means including pilot valve means selectively operable to allow bidirectional flow or unidirectional flow with respect to said source, said hydraulic control means producing a control pressure; and

a pressurizable hydraulic track adjuster means for controlling the tension in each track, said pressurizable hydraulic track adjuster means coupled to the hydraulic pressure source by said hydraulic control means and having pressure therein established by said hydraulic control means in response to said control signals for conditioning said hydraulic control means to vary the pressure in said hydraulic track adjuster means for applying a variable tension to each track according to the detected vehicle conditions.



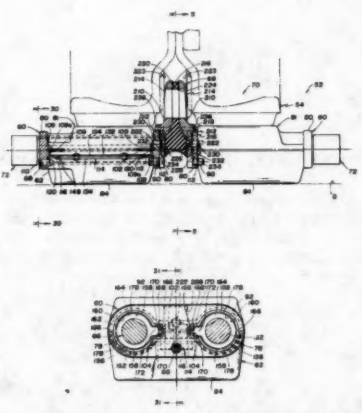
4,840,438
PIN AND BUSHING ASSEMBLY FOR SHOE ASSEMBLY OF TRACK LAYING VEHICLE

Robert M. Cory, Roseville, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Division of Ser. No. 752,186, Jul. 3, 1985, Pat. No. 4,700,992. This application Apr. 7, 1987, Ser. No. 35,442

Int. Cl.[4] B62D *55/21*

U.S. Cl. 305—36 **6 Claims**

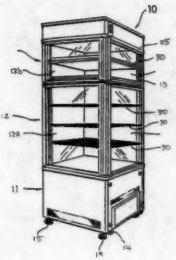


1. In an endless track for a track laying vehicle, said endless track being of the type including a plurality of shoe assemblies and connectors that extends between the shoe assemblies, and each shoe assembly including a pair of pin assemblies, each pin assembly comprising: a sleeve received within the associated shoe assembly; said sleeve including a pair of sheet metal sleeve members formed to define a generally round opening through the sleeve; a metal pin received within the opening in the sleeve and having opposite ends projecting outwardly from the sleeve to permit connection of adjacent shoe assemblies by connectors at the opposite ends of the pins thereof; a resilient bushing molded in situ of resilient material between the sleeve and the pin and bonded to both the sleeve and the pin; and the sleeve including a positioning flange that projects transverse to the pin and is cooperatively defined by the sleeve members and the resilient bushing material between the sleeve and the pin.

4,840,439
DISPLAY CABINET

Kenichi Nara, and Ryoichi Takahashi, both of Maebashi, Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 20,088, Feb. 27, 1987, abandoned. This application May 24, 1988, Ser. No. 201,323
Claims priority, application Japan, Mar. 3, 1986, 61-30215[U]; Mar. 3, 1986, 61-30216[U]
Int. Cl.[4] E05B 65/46
U.S. Cl. 312—116 21 Claims



1. A display cabinet comprising:

at least one structural member defining a compartment for displaying and storing merchandise, said structural member including a door movable between open and closed positions, said door when in the open position providing access to merchandise stored in said compartment;

a shelf disposed in said compartment to provide a support surface for merchandise stored in said compartment, said shelf having a shelf back portion, a shelf front portion, a shelf first side portion, and a shelf second side portion opposite to said shelf first side portion;

a slideable rod rectangular frame element positioned a discrete distance above and parallel to said shelf to position the merchandise supported on said support susrface of said shelf by sliding towards said shelf front portion and pushing merchandise therewith, the discrete distance being sufficient to prevent merchandise from tipping over when engaged and pushed relative to said shelf by said slidable rod rectangular frame element;

first and second spaced elongated sleeves through which said slideable rod rectangular frame element is slidably received;

a first support element fixing said first spaced elongated sleeve at said shelf first side portion;

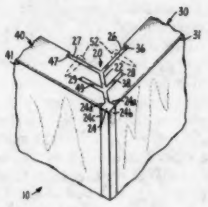
a second support element fixing said second spaced elongated sleeve at said shelf second side portion, said first and second support elements positioning said first and second spaced elongated sleeves, respectively, so that said slideable rod rectangular frame element is positioned at the discrete distance relative to said shelf for sliding movement relative to said shelf; and

a stopper element at said shelf back portion which holds, together with said first and second spaced elongated sleeves, said slideable rod rectangular frame element at the discrete distance when said slideable rod rectangular frame element is fully inserted in a stationary position in said compartment.

4,840,440
CORNER CONSTRUCTION APPARATUS AND METHOD

Monrow Dieter, P.O. Box 2008, Paso Robles, Calif. 93447

Continuation-in-part of Ser. No. 800,468, Nov. 21, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,449
Int. Cl.[4] A47F 3/00
U.S. Cl. 312—140 21 Claims



1. A cabinet corner constructed extrusion for mating with and joining a pair of side panels comprising a plurality of surface sections defined in cross-section by:

an elongate rigid rib section,

an external corner section positioned at one end of said rib section with a diagonal of said corner section aligned with the length of said rib section and having a pair of remote exposed faces and a pair of side faces,

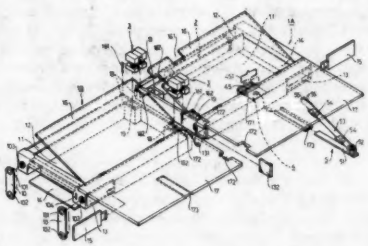
a pair of rigid external leg sections normal to one another and positioned at the other end of said rib section with the angle between said external leg sections bisected by the length of said rib section, and

a pair of rigid internal leg sections normal to one another, each of said internal leg sections being parallel to one of said external leg sections and located along said rib section substantially mid-way between the remote corner of said corner section and said external leg sections, the lengths of said internal leg sections being such that a normal projection of each internal leg section onto the adjacent external leg section ends substantially halfway along the length of such external leg section.

4,840,441
MULTI-FUNCTION SATCHEL

Hwa-Yang Tsay, 109, Cheng Shin Road, Kaohsiung, Taiwan

Filed Feb. 12, 1988, Ser. No. 155,497
Int. Cl.[4] A47R 27/00
U.S. Cl. 312—231 14 Claims



1. A multi-function satchel comprising:

a pair of rectangular, generally flat cases which are separate from each other, each case comprising (a) a large rectangular side, an opposed large rectangular side, four peripheral walls separating said large side and opposed large side by a a short distance such that the sides and peripheral walls define a flat case volume, and an interior wall be-

tween the sides which separate the case volume into a large space and at least one smaller space, (b) a pivotally moveable board mounted to the case to cover the large side of the case, and (c) a moveable lid pivotally mounted to the case to lie over the board on the large side of the case, the movable lid being pivotable through 180° about its pivot axis to form a generally planar surface with the board when the board closes the large side of the case,

first connecting means for connecting the cases together side by side with a peripheral wall of one case abutting a peripheral wall of the other case such that the respective two boards and the two lids, when turned through 180°, together form an enlarged, generally planar writing surface,

a second connecting means for connecting the two cases closed upon each other with their respective boards and lids closed onto their respective large sides of the case and the two large sides facing each other, whereby the two large spaces store large objects such as books or the like, and

wherein a peripheral wall of each said case includes an opening therein for access to its large space.

4,840,442

MULTIDIELECTRIC MIRROR FOR CARBON DIOXIDE LASER PROVIDING THE MID INFRARED, IN HIGH REFLECTANCE WITH GOOD PROTECTION AGAINST MECHANICAL ATTACK

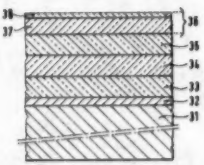
Jacques Mouchart, L'Hay les Roses; Gérard Villela, Marcoussis; Franck Dutois, Antony, and Bernard Pointu, Ballancourt sur Essonne, all of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Oct. 26, 1987, Ser. No. 112,159

Claims priority, application France, Oct. 28, 1986, 86 14971

Int. Cl.[4] G02B *1/10, 5/00;* **B32B** *33/00*

U.S. Cl. 350—1.6 **4 Claims**



1. A multidielectric mirror for reflecting light in the mid infrared from a carbon dioxide laser, said mirror comprising:

a substrate;

a reflector on said substrate, said reflector being made up from a stack of quarter-wavelength layers which succeed one another from the substrate, said layers being essentially constituted by low absorption dielectric materials having low absorption for said light to be reflected and alternating between having low and high refractive indeces and terminating with a high index last layer, each of said layers having an optical thickness close to a quarter-wavelength of said light so as to confer high reflectance to said mirror;

said mirror including a protective surface layer constituted by a protective dielectric material having greater hardness than said high index dielectric material;

said mirror including the improvement whereby at least the last of said high index quarter wavelength layers is a composite layer comprising:

a base layer whose optical thickness is a major fraction of the optically thickness of said composite layer and which is constituted by one of said dielectric materials having low absorption and high refractive index; and

said protective surface layer, the optical thickness of said protective layer constituting a minor fraction of the optical thickness of the composite layer, and said protective material having a higher refractive index than said high index and low absorption dielectric material so as to simultaneously obtain good mechanical protection for the stack together with increased reflectance even if the absorption of said protective material for said light is somewhat greater than the absorption of said low absorption dielectric materials.

4,840,443

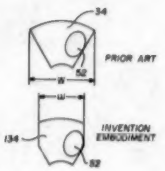
HOLOGRAPHIC SCANNER SPINNER

John R. Debesis, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,289

Int. Cl.[4] G02B *5/32, 26/10*

U.S. Cl. 350—3.71 **3 Claims**



1. A holographic scanner spinner including a disc having an axis and a plurality of sector-shaped facets bounded by radial lines extending radially from said axis, each facet having a diffraction grating pattern, each pattern extending to the two radial lines bounding its facet in regions between a first, and a second, greater radial distance from said axis and being radially spaced from said two radial lines in regions radially outwardly from said second radial distance.

4,840,444

COMPOSITE HOLOGRAPHIC ELEMENTS

Brian Hewitt, The Street, 2 Croft Cottages, Wattisfield, Suffolk, England IP22 1NS

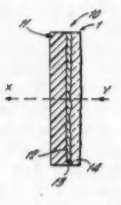
PCT No. PCT/GB87/00579, § 371 Date Apr. 13, 1988, § 102(e) Date Apr. 13, 1988, PCT Pub. No. WO88/01403, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 17, 1987, Ser. No. 190,686

Claims priority, application United Kingdom, Aug. 15, 1986, 8619922

Int. Cl.[4] G03H *1/22*

U.S. Cl. 350—3.85 **4 Claims**



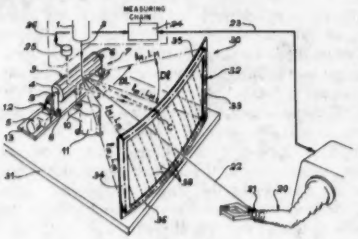
1. A composite optical element comprising a substrate having on one surface a surface relief pattern capable of providing a holographic image when viewed in reflection, a partially reflective layer facing the said surface of the substrate, and at least one thin optically absorbent layer adjacent the substrate to provide absorption of light incident on the substrate.

4,840,445

SYSTEM FOR LOCATING AN OBJECT IN SPACE

Bernard Lerat, Thones, France, assignor to Commisariat A L'Energie Atomique, Paris, France

Filed Jun. 9, 1988, Ser. No. 204,674
Claims priority, application France, Jun. 10, 1987, 87 08060
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 9 Claims



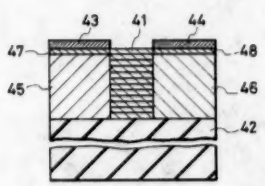
1. A system for locating an object, comprising a light emitting means emitting a light beam, a device that communicates, to the emitted light beam, a deflection that is variable as a function of time, making it perform scans along two directions, i.e. latitude and longitude, of a space in which the object is placed, a device enabling the measurement of this deflection, a first sensor which is fixed to the object and is sensitive to a first portion of the deflected light beam as well as a means to determine the direction of a second portion of the deflected light beam at the instant when the first portion of the deflected light beam sensitizes the first sensor.

4,840,446

PHOTO SEMICONDUCTOR DEVICE HAVING A MULTI-QUANTUM WELL STRUCTURE

Hitoshi Nakamura, Kanagawa; Shinji Sakano, Hachiouji; Hiroaki Inoue; Toshio Katsuyama, both of Hachiouji, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi Cable, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,601
Claims priority, application Japan, Sep. 16, 1986, 61-215806
Int. Cl.[4] G02F *1/15*
U.S. Cl. 350—96.13 10 Claims



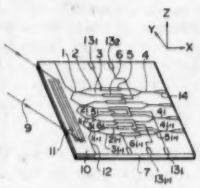
1. In a semiconductor device which has a multi-quantum well structure formed by laminating thin semiconductor layers on a semiconductor substrate and which operates in accordance with changes in refractive index caused by variations in the number of carriers in the region of said multi-quantum well structure, a photo semiconductor device which comprises means for injecting said carriers into said multi-quantum well structure region in a direction parallel to the surface of the laminated thin semiconductor layers constituting said multi-quantum well structure, wherein at least a portion of an optical waveguide provided on said semiconductor substrate has said multi-quantum well structure, and said means for injecting said carriers are provided on both sides, respectively, of that portion of said optical waveguide, so that said portion and said means for injecting said carriers from an optical modulating region.

4,840,447

LIGHT MODULATING DEVICE ARRAY

Keiji Kataoka, Kawagoe, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 95,616
Claims priority, application Japan, Sep. 10, 1986, 61-211563
Int. Cl.[4] G02B *6/10*; G02F *1/00*
U.S. Cl. 350—96.14 10 Claims



6. A light modulating device array formed in a surface of a crystal plate with an electrooptic effect, comprising:

an optical input coupling waveguide receiving a laser beam from a laser source;

an array of tapered waveguides arranged in parallel, each for passing a light beam from the optical input coupling waveguide towards a narrow end thereof;

a plurality of light modulators juxtaposed in a predetermined direction and receiving light beams from the tapered waveguide array,

each light modulator including an input waveguide coupled to said narrow end of the tapered waveguide, a pair of waveguides formed by bifurcating the input waveguide, and electrodes disposed on said pair of waveguides, for applying a control field thereto; and

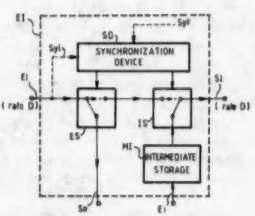
means connected to said electrodes, for applying the same potential to opposite ones of pairs of electrodes of adjacent light modulators and for enabling a different potential to be applied to others of said electrodes.

4,840,448

OPTICAL FIBER TRANSMISSION APPARATUS, IN PARTICULAR FOR SUBMARINE USE

Jean Thiennot, Gif-Sur-Yvette, France, assignor to Etat Francais Represente Par Le Ministre des Postes et Telecommunications-Centre National D'Etudes des Telecommunications, Issy Les Moulineaux, France

Filed Apr. 7, 1988, Ser. No. 178,986
Claims priority, application France, Apr. 14, 1987, 87 05306
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 35 Claims



1. An optical fiber cable transmission apparatus for distributing an underwater multiplexing function by enabling traffic

reconfiguration comprising a plurality of repeater-interchanger modules, each said repeater-interchanger module enclosed in a housing and interchanging frame segments between at least two selected fibers of said cable, each said repeater-interchanger module comprising:

means for receiving frame segments from groups of signal streams on fibers in said optical fiber cable;

means for converting said received frame segments to electrical signals for processing;

means for converting processed electrical signals to optical frame segments;

means for transmitting said optical frame segments to fibers in said cable;

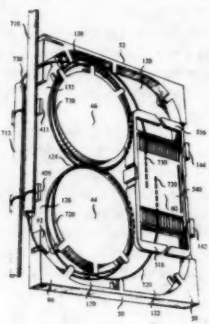
at least one interchange module associated with a synchronization means, said interchange module having electrical means for transferring data between said selected fibers by extracting segments from a first group of signal streams of a useful signal and for replacing said extracted segments with segments from a second group of signal streams.

4,840,449

OPTICAL FIBER SPLICE ORGANIZER

Shahryar Ghandeharizadeh, Hopatcong, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 27, 1988, Ser. No. 149,036
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **8 Claims**



1. A device for organizing optical fibers separated from at least one optical fiber cable comprising:

a rectangular base plate of prescribed width and length divided along its width into first and second rectangular sections;

sidewalls on the opposite edges along the width of the rectangular base plate; and

an optical fiber splice tray having a pair of opposite entrance sides for optical fiber ends;

the first rectangular section of the base plate comprising first and second cylinders extending outward a predetermined distance from the base plate, each cylinder having a diameter greater than twice the minimum bend radius of the separated optical fiber and being spaced from the other cylinder, from the sidewall adjacent thereto and from the edge of the rectangular base plate along the length of the first rectangular sections;

the second rectangular section of the base plate comprising means for mounting the optical fiber splice tray a predetermined distance from the base plate to form a channel for separated optical fibers between said base plate and the splice tray;

the at least one optical fiber cable running substantially parallel to the edge of the first section of the rectangular base plate along its length;

the space between the first cylinder and the sidewall adjacent thereto in the first rectangular section forming a first channel having an entrance at the edge of the rectangular base plate along its length for receiving a plurality of optical fibers separated from the at least one optical fiber cable running substantially parallel to the edge of the first rectangular section along its length,

a first passageway for directing at least one optical fiber separated from the at least one optical fiber cable running parallel to the length of the first rectangular section from the entrance of the first channel to one entrance side of the optical fiber splice tray, said first passageway guiding the at least one optical fiber at least around the first cylinder in a first direction through the first channel, the channel formed by the space between the first and second cylinders and the channel between the base plate and the splice tray in variable length loops each exceeding the minimum bend radius of the separated optical fiber, and

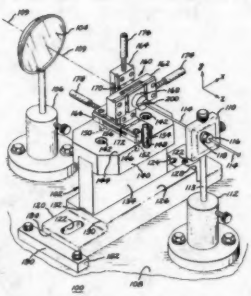
a second passageway for directing at least one other optical fiber separated from the at least one optical fiber cable running parallel to the length of the first rectangular section from the entrance of the first channel to the other entrance side of the optical fiber splice tray, said second passageway guiding the at least one other optical fiber at least around the first cylinder in a first direction and around the second cylinder in a second direction opposite the first direction through the first channel, the channel formed by the space between the first and second cylinders, the channel formed by the space between the second cylinder and the sidewall adjacent thereto and the channel between the base plate and the splice tray in variable length loops each exceeding the minimum bend radius of the optical fiber.

4,840,450

APPARATUS AND METHOD FOR OPTICAL FIBER END POSITIONING FOR LASER INJECTION

Marshall G. Jones; Angel L. Ortiz, Jr., both of Scotia; Tushar S. Chande, and John L. August, Jr., both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,844
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 **18 Claims**



1. Apparatus for positioning an end of an optical fiber at a predetermined location for injection with a laser beam, said fiber end predetermined location being uniquely defined relative to a laser beam axis and a reference surface, the fiber being mounted in fiber holding means for adjustably moving said fiber end in x, y and z mutually orthogonal coordinate directions to achieve said predetermined location, both the beam axis and a longitudinal axis of a fiber end portion adjoining the fiber end being parallel to said z-direction, said apparatus comprising:

positioning means for adjustably positioning an object af-

fixed thereto in three mutually orthogonal coordinate directions;

a mechanical seat affixed to said positioning means and including a planar seating surface for seating the fiber end, a predetermined position on said seating surface allocated for seating the fiber end when positioned at said predetermined location; and

means for supporting said positioning means in a unique predetermined relation to said reference surface so that the three orthogonal adjusting directions thereof are parallel to said x-, y-, and z-directions and said planar seating surface is both perpendicular to said z-direction and positioned to confront the fiber end positioned at said predetermined location, said supporting means further supporting said positioning means so that said seating surface can be adjusted in said x-, y- and z-directions until reaching first x, y and z positions effective to position the fiber end to substantially abut said seating surface predetermined position, said positioning means enabling restoration of said first x, y and z positions following positioning means readjustment along at least one of said x-, y- or z-directions to introduce sufficient clearance between said mechanical seat and the fiber end to allow removal of said positioning means and said mechanical seat;

so that for an initial installation of a first optical fiber with its fiber end positioned at said fiber end predetermined location, said positioning means can be adjustably positioned to said first x, y and z positions with the first fiber end substantially abutting said seating surface predetermined position and then said positioning means can be removed following readjustment in at least one of said x-, y- or z-directions and further so that in order to subsequently determine if the first fiber end is still positioned at said predetermined location or to install a second fiber in place of the first fiber, said positioning means is first reinstalled and adjusted so that said seating surface is positioned at said first x, y and z positions and then the fiber to be positioned is moved until the end thereof substantially abuts said seating surface predetermined position.

10. A method for positioning an end of an optical fiber at a predetermined location for injection with a laser beam, said fiber end predetermined location being uniquely defined relative to a beam axis and a reference surface, an end portion of the fiber proximate the fiber end being mounted in fiber holding means for adjustably moving said fiber end in x, y, and z mutually orthogonal coordinate directions to achieve said predetermined location, both the beam axis and a longitudinal axis of the fiber end portion being parallel to said z-direction, said method comprising the steps of:

(a) mounting a planar seating surface of a mechanical seat to confront the end of a first optical fiber where that fiber end is positioned at said predetermined location, said seating surface including a predetermined position allocated for seating the fiber end when positioned at said predetermined location, said seating surface being perpendicular to said z-direction;

(b) adjusting the position of said mechanical seat in said x-, y- and z-directions until reaching first x, y and z positions effective to position said first fiber end to substantially abut said seating surface predetermined position;

(c) readjusting the position of said mechanical seat in at least one of said x-, y- or z-directions by a distance sufficient to effect a clearance between said mechanical seat and the first fiber end to allow removal of said mechanical seat;

(d) removing said mechanical seat to enable injection of the laser beam into the first fiber end;

upon replacement of the first fiber with a second fiber, the second fiber being mounted in the fiber holding means, positioning the second fiber end at the fiber predetermined location by performing the steps of:

(e) remounting the mechanical seat to a position identical to that which it held in step(b) relative to said x-, y- and z-directions including adjustment to restore said first x, y and z positions;

(f) moving the second fiber in said x-, y- and z-directions until the end thereof substantially abuts said seating surface predetermined position;.

(g) repeating step(c); and

(h) removing said mechanical seat to enable injection of the laser beam into the second fiber end.

4,840,451

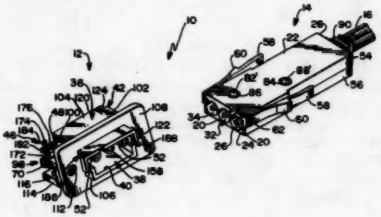
SHIELDED FIBER OPTIC CONNECTOR ASSEMBLY

Stephen A. Sampson, Downers Grove; Philip J. Dambach, and David L. Brunker, both of Naperville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Dec. 8, 1987, Ser. No. 130,145

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **22 Claims**



1. A fiber optic receptacle connector for connecting at least one optical-electronic device of the type including a body with a major face and having a lens projecting from said face to at least one end of an optical fiber secured in a plug connector, said receptacle connector comprising;

a plug-receiving socket with a front opening and a rear wall, said rear wall including a corresponding number of spaced interface apertures, each interface aperture being aligned with and dimensioned to closely coaxially receive the projecting lens of one said optical-electronic device, said rear wall further including a corresponding number of tubular projections coaxially aligned with and surrounding each aperture extending forwardly into the plug-receiving socket,

whereby, as a plug connector is inserted into the socket, each said optical fiber end is received and guided by a said tubular projection into abutting coaxial alignment with the aperture and lens, respectively.

4,840,452

LIGHT WAVE CONDUCTOR-SENSOR FOR TENSION

Helmut Federmann, Bergisch Gladbach; Friedrich K. Levacher, Brauweiler, and Georg Noack, Bergisch, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 798,014

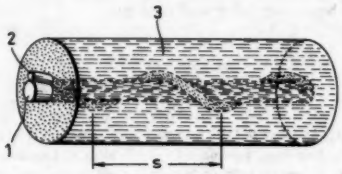
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 8433322; Jul. 27, 1985, 3526966

Int. Cl.[4] G02B *6/44;* H01J *5/16*

U.S. Cl. 350—96.23 **23 Claims**

1. A light wave conductor-sensor for tension, comprising a primary coated light wave conducting element; at least one coil wound on said primary coated light wave conducting element and forming together with the latter a sensor core; and a compound including longitudinally extending tension-proof fibers embedded in a synthetic plastic matrix, said compound forming a casing for said sensor core, said primary coated light

wave conducting element having a predetermined diameter, said coil having a length of twist which is greater than 2.2 times the diameter of said primary coated light wave conducting element.



4,840,453

COMPOSITE OVERHEAD STRANDED CONDUCTOR

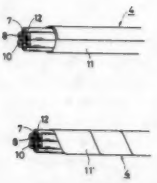
Yoshinobu Kitayama, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 15, 1986, Ser. No. 852,464

Claims priority, application Japan, Apr. 17, 1985, 60-57908[U]; Dec. 4, 1985, 60-187003[U]

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **8 Claims**



1. In a composite overhead stranded conductor having an optical fiber comprising a protective tube disposed around a spacer having a plurality of spiral grooves formed in its periphery for accommodating optical fibers, the improvement wherein the optical fibers accommodated within each spiral groove comprises a plurality of glass fibers, each having a primary coating layer bonded thereto, said glass fibers being stranded together with a thin heat-resistant tape applied to and over the stranded fibers, contacting the stranded fibers continuously over an axial direction of said tube and holding them in a bundle such that the outer diameter of said bundle is approximately the same as the outer diameter of said stranded fibers.

4,840,454

OPTICAL CABLE AND METHOD OF MANUFACTURING

Ernst Mayr, Starnberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschat, Berlin and Munich, Fed. Rep. of Germany

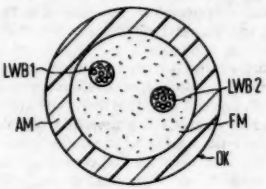
Filed Aug. 17, 1987, Ser. No. 86,273

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629827

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **12 Claims**

1. In an optical cable having an outer cladding containing at least one light waveguide bundle containing a plurality of light waveguides and a filling compound providing longitudinal tightness of the bundle in the cable, the improvements comprising each light waveguide bundle being saturated with an adhering, first filling compound which has a viscosity and still holds together the light waveguides of each light waveguide bundle and wherein the remaining space within the outer cladding being filled with a second filling compound having a viscosity that is lower than the viscosity of the first filling compound.



4,840,455

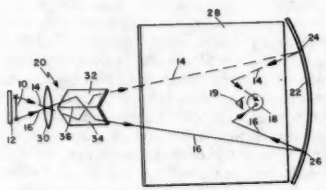
3-DIMENSIONAL OPTICAL VIEWING SYSTEM

Paul S. Kempf, Solana Beach, Calif., assignor to Paul Stuart Kempf and Pilar Moreno Family Trust, Encinitas, Calif.

Filed Mar. 20, 1985, Ser. No. 714,102

Int. Cl.[4] G02B *27/22*

U.S. Cl. 350—137 **11 Claims**



1. An optical system for providing a 3-dimensional view of an object, comprising:

means for holding an object to be viewed;

image forming and separating means for forming and projecting two different images of the same object from different angles along diffrent optical paths through the system, the image forming and separating means comprising a projection lens and a pair of angled mirrors positioned to shutter opposite halves of the lens from each other to project separate images from opposite halves of the lens; and

means for directing the images separately into the retina of at least one eye of an observer.

4,840,456

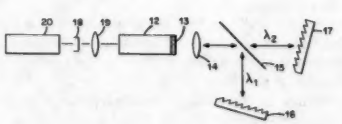
METHODS OF AND APPARATUS FOR GENERATION OF RADIO FREQUENCY SIGNALS

Donald M. Fye, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1987, Ser. No. 138,233

Int. Cl.[4] G02B *27/44*; H01S *3/082*

U.S. Cl. 350—162.17 **22 Claims**



1. An extremely high frequency electrical generator comprising;

means for generating a collimated coherent light beam along a first path;

beam splitting means oriented along said first path for splitting said light beam into two components, one of said components being directed along a second path, and the other of said components being directed along a third path, said second and third paths being non-coincident;

a first frequency selective element means oriented along said second path for receiving said one component and reflecting back, along said second path, toward said beam splitting means, light at the wavelength λ_1;

a second frequency selective element means oriented along said third path for receiving said other component and reflecting back, along said third path, toward said beam splitting means, light at the wavelength λ_2;

whereby said beam splitting means combines said light at said wavelengths λ_1 and λ_2 along a fourth path; and

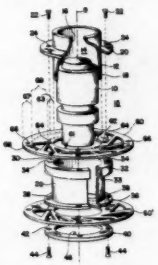
a photodetecting means oriented along said fourth path for receiving light at said wavelengths λ_1 and λ_2 and for providing electrical signals at the wavelength, $|\lambda_1-\lambda_2|$.

4,840,457

ANGLED STRUT DIAPHRAGM SPRING

James N. Remer, Cherry Hill, N.J., assignor to General Electric Company, Camden, N.J.

Filed Dec. 17, 1987, Ser. No. 134,121
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—255 **10 Claims**



1. An arrangement supporting a lens relative to a frame for providing motion normal to a flat surface of a disc storage medium, comprising:

a lens arrangement adapted for motion in a direction along a lens axis and normal to said flat surface of said disc;

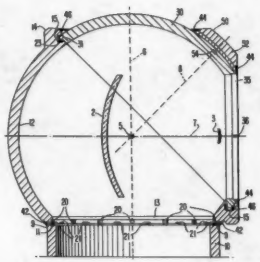
at least one thin, flat support means, said support means including a first circular support region fixed to the periphery of said lens arrangement, said first circular support region having a diameter, said support means further including a second circular support region mechanically affixed to said frame, said second circular support region having a diameter greater than said diameter of said first circular support region and being coaxial therewith, said support means further comprising a plurality of elongated arms extending between and interconnecting said first and second circular support regions of said support means, each of said elongated arms having substantially straight, parallel first and second elongated sides, one end of said first elongated side of each arm joining said first circular support region at a respective reference radial from said axis, and a second end of said first elongated side joining said second circular support region at a respective second radial angularly displaced from said reference radial in one angular direction, one end of said second elongated side of each arm joining said first circular support region at a respective third radial displaced from said reference radial in an angular direction opposite to said one angular direction, the other end of said second elongated side extending to join said second circular support region at a point within the arc subtended by said reference and second radials.

4,840,458

FIXED SHUTTER CONSTRUCTION FOR A SPLIT-SPHERE OBSERVATORY DOME

Ethan W. Cliffton, 3435 Army St., Suite 332, San Francisco, Calif. 94110

Filed Dec. 8, 1987, Ser. No. 130,125
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—319 **7 Claims**



1. In a split-sphere observatory dome of the type comprising:

a cylindrical base having a circular peripheral edge.

an antrum shell having a first circular peripheral edge rotatably supported on the circular peripheral edge of the cylindrical base and a second circular peripheral edge disposed at an acute angle with respect to said first circular peripheral edge,

a rotor shell having a first circular peripheral edge rotatably supported on the second circular peripheral edge of the antrum shell and a second circular peripheral edge disposed at an angle with respect to said first circular peripheral edge of said rotor shell and tangential thereto at a point, said second circular peripheral edge of said rotor shell defining the periphery of a planar oculus;

wherein upon rotation of the rotor shell said oculus revolves about an axis of rotation along a path wherein the orientation of the plane of the oculus varies between a vertical orientation and a horizontal orientation;

the improvement comprising:

a shutter lid fixed to said antrum shell proximate said second circular peripheral edge of said antrum shell, said shutter lid covering a portion of said rotor shell and exposing a portion of said rotor shell, said oculus being revolvable between a position wherein said lid completely covers said oculus and a position wherein said oculus is completely exposed.

4,840,459

MATRIX ADDRESSED FLAT PANEL LIQUID CRYSTAL DISPLAY DEVICE WITH DUAL ENDED AUXILIARY REPAIR LINES FOR ADDRESS LINE REPAIR

Michael F. Strong, Patersonville, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,199
Int. Cl.[4] G02F *1/13*; G09G *3/36*
U.S. Cl. 350—333 **7 Claims**

1. An information display device comprising:

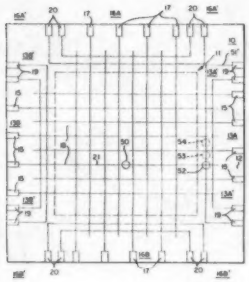
(a) a plurality of optical display elements arranged in an X-Y matrix format;

(b) a plurality of main X address lines of electrically conductive material;

(c) a plurality of main Y address lines of electrically conductive material, said X and Y address lines being transversely oriented to each other;

(d) each of said optical display elements being connected to a single main X address line and to a single main Y address line through an individual switching device whereby each of said elements has a unique X-Y address in the said matrix; and main X and Y address lines being adapted to supply energizing and switching signals to said optical display elements to provide an optical output;

(e) a plurality of auxiliary address lines of electrically conducting material crossing over each of said main X and main Y address lines at a plurality of crossover points said auxiliary address lines being electrically insulated from the crossover points each of said auxiliary address lines



adapted to be connected to one of said main address lines at a crossover point to repair any open circuited main address line to allow said repaired main address line to be driven from said auxiliary line, the number of auxiliary lines associated with said main X and Y address lines being less in number than the main address lines;

(f) each of said auxiliary lines having signal input pads at each end so that said auxiliary line may be driven from both ends; whereby severance of an auxiliary line beyond the crossover point at which said auxiliary line is connected to a main line converts an auxiliary line into two repair line portions, said portion beyond the initial point of repair being adapted to be connected to any one of the main address lines beyond said initial point of repair for further repair.

4,840,460

APPARATUS AND METHOD FOR PROVIDING A GRAY SCALE CAPABILITY IN A LIQUID CRYSTAL DISPLAY UNIT

Anthony J. Bernot, Gilbert, and Michael J. Johnson, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 13, 1987, Ser. No. 120,456
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—333 **20 Claims**

8. The method of implementing a gray scale for a pixel in a liquid crystal display, said method comprising the steps of:

dividing said pixel into an plurality of subpixels;

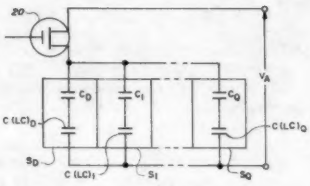
enclosing each subpixel between a first and a second conducting surface;

dividing each subpixel into a first and a second volume, said first volume proximate said first conducting surface, said second volume proximate said second conducting surface, said first and said second volume sharing a common boundary;

placing a liquid crystal material in said first volume;

fabricating said second volume with a dielectric material; and

applying a voltage to between said first and said second conducting surface, said voltage causing an elelctric field to be applied to said liquid crystal material, said electric



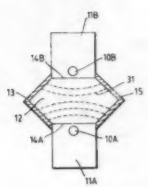
field being determined by subpixel parameters, said subpixel parameters adjusted to provide optical activity saturation of each subpixel for a preselected voltage.

4,840,461

OPTICAL SWITCHING DEVICES HAVING LIQUID CRYSTAL WITH SPLAYED MOLECULAR ORIENTATION

Christopher S. Winter, and Raman Kashyap, both of Ipswich, England, assignors to British Telecommunications public limited company, United Kingdom

Filed Oct. 2, 1987, Ser. No. 103,734
Claims priority, application United Kingdom, Oct. 7, 1986, 8624071; Jan. 20, 1987, 8701174
Int. Cl.[4] G02F *1/13*; G02B *6/42*; H01P *1/10*
U.S. Cl. 350—346 **17 Claims**



1. An optical switch which comprises:

a confining region associated with and between at least two optical path regions;

said confining region including a liquid crystal control region which is switchable between two refractive index states for switchably coupling optical signals between said two path regions and having a splayed molecular orientation in at least one of said states so as to reduce switch sensitivity to the polarization of optical signals in said path regions.

4,840,462

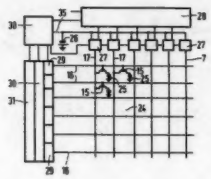
METHOD OF DRIVING A FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE AND ASSOCIATED DISPLAY DEVICE TO ACHIEVE GRAY SCALE

Wilbert J. A. M. Hartmann, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,424
Claims priority, application Netherlands, Mar. 17, 1987, 8700627
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S **9 Claims**

1. A method of driving a display device for displaying grey scales, comprising a ferro-electric liquid crystal between two supporting plates and a system of pixels arranged in rows and columns, each pixel being constituted by picture electrodes provided on the facing surfaces of the supporting plates, and a system of row and column electrodes, at least one row of pixels being selected via a row electrode during a line selection per-

iod, data signals being presented via the column electrodes, and the row of pixels, prior to selection, being brought to an extreme state by means of an auxiliary signal, characterized in that during at least a part of the line selection period the pixels are connected via active switching elements to the column electrodes in order to present data signals to the pixels, in that the auxiliary signal is presented to the pixels via the same switching elements, the auxiliary signal being presented at an instant before the commencement of the line selection over at



least a period which is equal to the switching period of the ferro-electric medium and which has such a duration and amplitude that the extreme transmission state is reached, in that after the line selection period the pixels assume a transmission state which is substantially exclusively determined by the data presented, and characterized in that the grey scale is determined by the duration and the amplitude of the data signal presented during the period when the row of pixels is selected for data display.

4,840,463

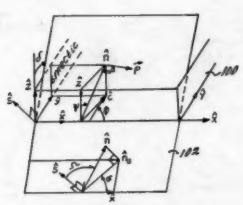
SURFACE STABILIZED FERROELECTRIC LIQUID CRYSTAL DEVICES

Noel A. Clark, 3106 Kittrell Ct., Boulder, Colo. 80303, and Sven T. Lagerwall, 30 Snackvagen, Goteborg, Sweden

Division of Ser. No. 88,482, Aug. 19, 1987, Pat. No. 4,813,767, which is a continuation of Ser. No. 797,021, Nov. 12, 1985, abandoned, which is a division of Ser. No. 571,733, Jul. 7, 1983, Pat. No. 4,563,059, which is a continuation-in-part of Ser. No. 456,844, Apr. 10, 1983, abandoned, which is a continuation of Ser. No. 110,451, Jan. 8, 1980, Pat. No. 4,367,924. This application Jul. 28, 1988, Ser. No. 225,464

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—350 S **19 Claims**



1. A process of making a liquid crystal device including a ferroelectric liquid crystal, molecules, having long axes, in a bulk of said liquid crystal forming helices and first and second means for containing said liquid crystal, said process comprising the steps of:

forming layers of said molecules at an angle different from 90° to said first and second means;

aligning the molecules of said liquid crystal adjacent to at least said first means at an angle $\Omega(\alpha)$ from the normal to said first means, said angle $\Omega(\alpha)$ being a predetermined function of an angle α, said angle α being an angle between a reference vector in a plane parallel to said first means and a projection of said long axes of said molecules onto said plane, said aligning step allowing said molecules to move between at least two particular orientations; and

suppressing the formation of said helices.

4,840,464

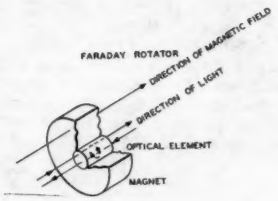
OPTICAL ISOLATOR EMPLOYING A GERMANIUM-ARSENIC-SELENIUM COMPOSITION

Donald K. Wilson, 102 Hillside Ave., West Caldwell, N.J. 07006

Filed Mar. 28, 1988, Ser. No. 172,779

Int. Cl.⁴ G02F *1/09*

U.S. Cl. 350—355 **13 Claims**



1. A Faraday rotor comprising an optical element in which is rotated a plane of polarization of polarized light along an optical axis, said optical element comprising a rod comprising an optically transmitting composition comprising from about 15 wt. % to about 50 wt. % germanium, from about 5 wt. % to about 20 wt. % arsenic, and from about 30 wt. % to about 80 wt. % selenium; and means for generating a magnetic field along the optical axis of said optical element, thereby rotating said plane of polarization of polarized light in said optical element.

4,840,465

DEVICE FOR CORRECTING DISTORTION

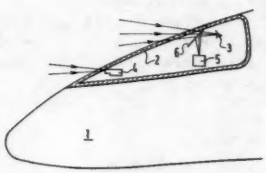
Fernand R. Loy, Sceaux; Jean-Claude Perrin, Macon, and Joël Rollin, Vanves, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

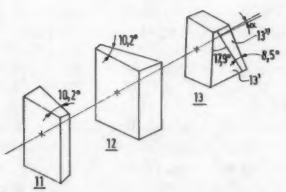
Filed Nov. 19, 1987, Ser. No. 123,034

Claims priority, application France, Nov. 21, 1986, 86 16234

Int. Cl.⁴ G02B *13/10, 27/14*

U.S. Cl. 350—421 **6 Claims**





1. A device correcting the differential distortion resulting

from superimposing the images received by first and second receivers sensitive in a given spectral band, said images resulting from simultaneous observation of a field of view at two distinct locations through a shield transparent in said given spectral band, said shield having a shape generating distortion without rotational symmetry, said device comprising an optical correction system having a modular structure using parallel beams and being arranged between said shield and said second receiver, said system introducing a distortion having a curvature and variation of length of lines opposite those of said differential distortion.

4,840,466

CHANGEABLE MAGNIFICATION OPTICAL SYSTEM

Yasuyuki Yamada, Tokyo, and Isao Nakazawa, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,138

Claims priority, application Japan, Jun. 10, 1985, 60-125798

Int. Cl.[4] G02B *15/02, 17/00;* G03B *15/00, 1/18*

U.S. Cl. 350—422 **25 Claims**

1. A changeable magnification optical system comprising:

a plurality of optical paths, each of which conducts light from an object to an image receiving surface;

optical path selecting means for selecting one of said plurality of optical paths;

switch optical means switchable between said plurality of optical paths for causing the magnification to change in cooperation with selection of the optical path by said optical path selecting means; and

second optical means arranged in at least one of said plurality of optical paths to receive light transmitted through the first optical means when said first optical means is in one of said optical paths.

4,840,467

COMPACT ZOOM LENS SYSTEM WITH A HIGH ZOOMING RATIO

Katsuhiro Takada, and Takanori Yamanashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

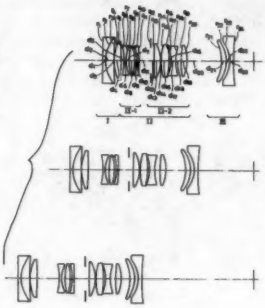
Filed Dec. 24, 1987, Ser. No. 137,678

Claims priority, application Japan, Dec. 25, 1986, 61-307797

Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **10 Claims**

1. A compact zoom lens system with a high zooming ratio comprising, in order from the object side, a first lens group having a positive refracting power, a second lens group having a positive refracting power and a third lens group having a negative refracting power, and being arranged to be zoomed by varying the space between said first lens group and said second lens group and the space between said second lens group and said third lens group, in which at least one graded refractive index lens having the distribution of the refractive



index thereof in the direction of the optical axis is arranged in at least one lens group.

4,840,468

FOCUSING METHOD FOR ZOOM LENS

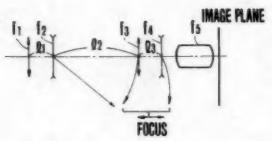
Tsunefumi Tanaka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 158,053, Feb. 12, 1988, abandoned, which is a continuation of Ser. No. 933,261, Nov. 19, 1986, abandoned, which is a continuation of Ser. No. 722,990, Apr. 15, 1985, abandoned, which is a continuation of Ser. No. 460,364, Jan. 24, 1983, abandoned. This application Nov. 14, 1988, Ser. No. 273,172

Claims priority, application Japan, Feb. 8, 1982, 57-18410

Int. Cl.[4] G02B *15/18*

U.S. Cl. 350—427 **15 Claims**



1. A zoom lens comprising:

a first lens component, stationary during focusing;

a second lens component;

a third lens component; and

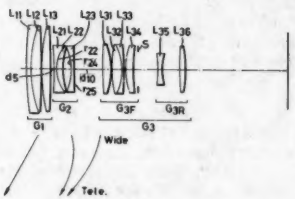
a fourth lens component, said third and fourth lens components moving as a unit when focusing is made, and moving in such a manner that their overall refractive power varies when zooming is made, said second lens component being movable simultaneously with said third lens component and said fourth lens component during zooming and being stationary during focusing, wherein the movement of said third and fourth lens components relative to a given object distant is substantially linear over the whole range of variation in focal length and substantially linear relative to all object distances focusable by the movement of the third and fourth lens components.

4,840,469

TELEPHOTO ZOOM LENS

Keiji Moriyama, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,581
Claims priority, application Japan, Nov. 6, 1986, 61-264315; Nov. 6, 1986, 61-264316
Int. Cl.[4] G02B 15/16, 9/64
U.S. Cl. 350—427 13 Claims



1. A telephoto zoom lens comprising, in succession from the object side, a first lens group having a positive refractive power, a second lens group having a negative refractive power, and a third lens group having a positive refractive power, said lens group being moved independently of each other during zooming and satisfying the following conditions:

$$1.3 < f_1/f_w < 1.6$$

$$0.25 < |f_2/f_W| < 0.45$$

$$0.44 < f_3/f_W < 0.52$$

$$1.3 < \left|\frac{1}{\beta_{2W}} - \frac{1}{\beta_{2T}}\right| < 1.55$$

$$0.5 < \beta_{2W}/\beta_{2T} < 0.6$$

$$0.1 < \left|\frac{1}{\beta_{3W}} - \frac{1}{\beta_{3T}}\right| < 0.3$$

$$0.55 < \beta_{3W}/\beta_{3T} < 0.75$$

where

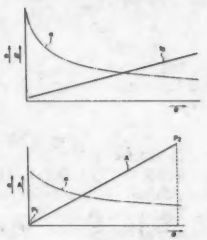
f_W: the focal length of the entire system at the wide end
f_1: the focal length of the first lens group
f_2: the focal length of the second lens group
f_3: the focal length of the third lens group
β_{2W}: the imaging magnification at the wide end of the second lens group
β_{2T}: the imaging magnification at the telephoto end of the second lens group
β_{3W}: the imaging magnification at the wide end of the third lens group
β_{3T}: the imaging magnification at the telephoto end of the third lens group.

4,840,470

DRIVE CONTROL OF ZOOM LENS IN ZOOMING SYSTEM

Yoshichi Ohtake, Kamakura, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Dec. 28, 1987, Ser. No. 137,921
Claims priority, application Japan, Dec. 27, 1986, 61-313004; Dec. 27, 1986, 61-313005
Int. Cl.[4] G02B 15/00
U.S. Cl. 350—429 6 Claims



1. An optical zooming system comprising:

zoom lens means for varying the focal length of said zooming system by its own movement in directions of the optical axis thereof, said zoom lens means having engaging means at its peripheral surface;

cylindrical cam means arranged to encase said zoom lens means and having a cam groove at its inner circumferential surface, said engaging means of said zoom lens means being engaged with said cam groove to be movable along said cam groove; and

drive means coupled to said cylindrical cam means to rotate said cylindrical cam means so that said zoom lens means is moved in the optical axis directions in response to the rotation of said cylindrical cam means, the movement of said zoom lens means resulting from the engagement between said engaging means of said zoom lens means and said cam groove of said cylindrical cam means;

wherein said cam groove has a configuration formed so that the focal length of said zooming system is varied in substantially linear relationship to the angle of rotation of said cylindrical cam means.

4,840,471

X-RAY SHIELDED PROJECTION LENS

Katsuaki Mitani, Ibaraki, and Hideki Ishinaga, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

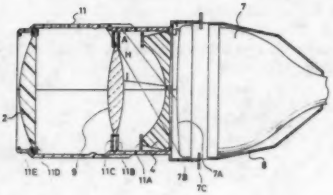
Filed Aug. 10, 1987, Ser. No. 83,337
Claims priority, application Japan, Aug. 11, 1986, 61-188133; Feb. 20, 1987, 62-38404
Int. Cl.[4] G02B 27/00
U.S. Cl. 350—438 10 Claims

1. An X-ray shielded projection lens mounted in front of a cathode ray tube apparatus, said projection lens comprising:

at least one lens element which is made of glass for absorbing X-rays irradiated from said cathode ray tube apparatus; and

a body tube made of a plastic material containing X-ray shielding material, and having a cover portion for encasing the entire front portion of said cathode ray tube apparatus so as to cover a gap defined between said cathode ray tube apparatus and said at least one lens element and

thereby to prevent leakage of X-rays through said gap, and lens element positioning means for positioning each



said at least one lens element at a predetermined position relative to the front of said cathode ray tube apparatus.

4,840,472

REFLECTING/REFRACTIVE OPTICAL SYSTEM

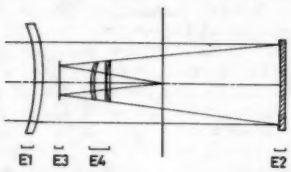
Yasunori Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,736

Claims priority, application Japan, Apr. 9, 1987, 62-88167

Int. Cl.[4] G02B *17/08*

U.S. Cl. 350—442 **5 Claims**



1. A reflecting/refractive optical system having four optical units arranged along the optical path, comprising, in order from the object side: a first optical unit comprising a meniscus lens having a weak negative power, a second optical unit comprising a reflecting surface having a positive power, a third optical unit for deflecting light reflected from the second optical unit, and a fourth optical unit comprising at least one negative lens element, said system satisfying the following conditions:

(1) $-0.15<f/f_I<0$

(2) $0.55<|R_{I,1}|/f<0.90$

(3) $0.60<f/f_{II}<0.90$

(4) $0.40<l_{II,III}/f_{II}<0.8$

where

f : focal length of the overall system

f_I : focal length of the first optical unit

$R_{I,1}$: radius of curvature of the first surface of the first optical unit

$l_{II,III}$: the aerial distance from the second optical unit to the third optical unit.

4,840,473

OPTICAL DEVICE

Nobuo Kushibiki, Ebina; Noriyuki Nose, Sagamihara; Toshiyuki Nakajima, Atsugi; Takeshi Baba, Atsugi; Masakazu Matsugu, Atsugi, and Yukichi Niwa, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

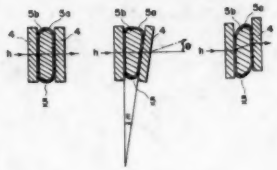
Filed Sep. 18, 1986, Ser. No. 908,725

Claims priority, application Japan, Sep. 27, 1985, 60-215493

Int. Cl.[4] G02B *27/40*

U.S. Cl. 350—484 **9 Claims**

1. An optical device, comprising a plurality of sandwiching members and deformable member sandwiched by the plurality of sandwiching members, the shear modulus of the deformable member decreasing toward the inside thereof; said deformable member comprising an elastomeric core and an elastomeric



coating covering the core; said elastomeric core having a shear modulus in the range 1×10^2 dyne/cm^2 to 5×10^5 dyne/cm^2; said elastomeric coating having a shear modulus in the range of 1×10^4 dyne/cm^2 to 1×10^9 dyne/cm^2.

4,840,474

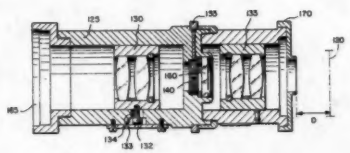
FURNACE VIEWING SYSTEM

Dallas E. Heft, 130 Chippewa Dr., Lancaster, Ohio 43130, and Donald A. Carignan, P.O. Box 381, Westfield, Mass. 01086

Filed Jul. 2, 1987, Ser. No. 69,343

Int. Cl.[4] G02B *15/10*

U.S. Cl. 350—572 **3 Claims**



1. In a furnace viewing system, an adapter device for installation between a conventional lens tube and a conventional television camera comprising

iris control means for controlling the amount of light passing through the lens tube,

lens means for inverting the image passing through the lens tube, and

focus control means for adjusting the spacing between the camera and said lens means.

4,840,475

EXTERNAL MIRROR FOR VEHICLES

Siegfried Herzog, Steinenbronn; Dieter Eckert, Magstadt, and Max Bausch, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 14, 1987, Ser. No. 38,137

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613878

Int. Cl.[4] B60R *1/06*; G02B *5/08, 7/18*

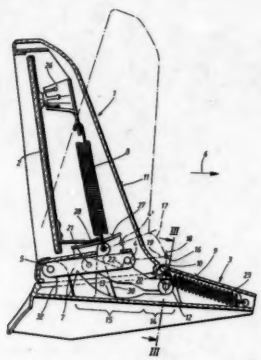
U.S. Cl. 350—604 **20 Claims**

1. External mirror for vehicles having a mirror casing, which is stationary in the operating position and in which a mirror glass is held so as to be adjustable, and having a mirror base holding the mirror casing and immovably located relative to the vehicle, also having two hinge pins located at a distance apart one behind the other in the direction of travel and approximately parallel to the external surface of the vehicle, these hinge pins being provided for the mirror casing so that the latter can, in the case of collision, move either to the front or to the rear, one of which hinge pins is located immovably with respect to the mirror base and the other relatively immovably with respect to the mirror casing, the two hinge pins being

rigidly connected together by means of a coupling link, also having at least one spring acting, in its effective direction, transverse to the hinge pins and clamping the mirror casing in the operating position defined by stops on the mirror casing and/or mirror base, characterized by the combination of the following features:

the mirror base is provided with a rigid streamlined fairing which—in the operating position of the mirror casing - merges flush with a gap in a streamline fairing of the mirror casing;

the hinge pin with fixed location relative to the mirror base is located to the rear with respect to the direction of vehicle travel and the other hinge pin, arranged to be relatively immobile with respect to the mirror casing is located at the front with respect to the direction of travel vehicle;



a pivotably or rotatably held guide part is provided on the mirror casing at a distance from the front hinge pin and in the direction towards the mirror base and/or offset relative to it towards the front, which guide part interacts with guide track located in the mirror base, the guide surface of which guide track points in the direction of the mirror casing and is in contact with the guide part at least in the operating position of the mirror casing; and

the guide track has—seen in the plane of pivoting of the mirror casing—at least in a front part, a shape such that when the mirror casing pivots out of the operating position in the forward direction, the instantaneous center of the pivoting motion represented by the current intersection point of the connecting line between the two hinge pins of the mirror casing with the guide track normal at the kinematically effective contact point of the guide part, is always located outside the fairing parts but in the vicinity of the gap.

4,840,476

COMPACT EYEGLASS CONSTRUCTION

Craig E. Rooney, Prairie Village, Kans., assignor to John Gareis, Kansas City, Mo.

Filed Dec. 31, 1987, Ser. No. 140,300

Int. Cl.[4] G02C *5/08*

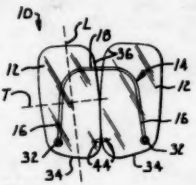
U.S. Cl. 351—63 **13 Claims**

1. An eyeglass construction comprising:

a pair of lenses each having a longitudinal axis and a shorter transverse axis;

an arched nose bridge having a pair of spaced apart lower ends; and

means for mounting said lenses on the respective lower ends of said nose bridge in a manner permitting the lenses to pivot about substantially parallel pivot axes between a wearing position wherein the transverse axes of the lenses are generally parallel and a compact storage position wherein the longitudinal axes of the lenses are generally parallel, said mounting means comprising a passage formed through each lens, a bushing fitted in each passage, and a pivot pin on each of said lower ends of the nose bridge, said pivot pins being fitted in the respective bushings and being rotatable therein to mount the lenses on the nose bridge.



4,840,477

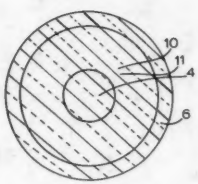
DYED COLOR CHANGE CONTACT LENS

Charles W. Neefe, Big Spring, Tex., assignor to Sunsoft Corp., Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 147,148, Jan. 22, 1988, which is a continuation-in-part of Ser. No. 869,583, Jun. 2, 1986, Pat. No. 4,738,520, which is a continuation-in-part of Ser. No. 832,381, Feb. 24, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 211,335

Int. Cl.[4] G02C *7/04*

U.S. Cl. 351—162 **17 Claims**



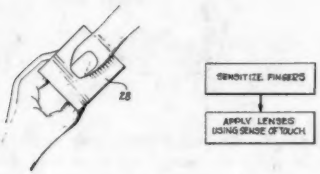
1. A molded contact lens that changes the apparent color of the eye having a dyed or molded transparent colored iris area on the convex lens surface and a light reflecting iris area precipitated on the concave lens surface and when the lens is placed on the cornea of an eye, persons viewing the eye will perceive an apparent eye color change because the concave light reflecting iris area is seen through the convex transparent colored iris area.

4,840,478

METHOD AND ARTICLE OF MANUFACTURE FOR INSERTING CONTACT LENS

Sidney F. Young, 355 N. Wilmot Rd., Tucson, Ariz. 85711

Division of Ser. No. 853,651, Apr. 18, 1986, Pat. No. 4,757,571.
This application Feb. 16, 1988, Ser. No. 156,341
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—177 6 Claims



1. In a method of inserting a contact lens in a human eye by hand, the steps comprising:

a. sensitizing the fingers; and

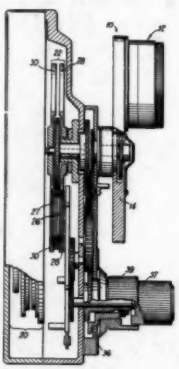
b. applying the lens by sense of touch with the sensitized fingers.

4,840,479

CROSSED CYLINDER LENSES REFRACTOR WITH THREE-LENS VARIABLE CROSSED CYLINDER ASSEMBLY AND METHOD OF USE

Clinton N. Sims, 3432 W. Riverside Dr., Ft. Myers, Fla. 33901

Continuation-in-part of Ser. No. 23,980, Mar. 16, 1987, which is a continuation of Ser. No. 670,398, Nov. 9, 1984, abandoned.
This application Nov. 2, 1987, Ser. No. 116,322
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—235 21 Claims



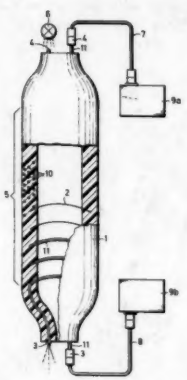
1. A refractor, comprising a pair of batteries, each battery comprising a viewing tube, selectable sphere lenses, and a variable, three-lens crossed cylinder lens assembly comprising a stationary cylinder lens and two identical cylinder lenses concurrently alignable with the viewing tube, each identical cylinder lens of power equal to one-half the stationary lens power and of opposite sign, mounted in a means for rotating them in opposite directions at the same rate relative to a combined lens axis.

4,840,480

LIGHT CONDUIT ARRANGEMENT FOR MONITORING A PHYSICAL CONDITION OF A STRUCTURAL PART

J. Peter Starke, Odenthal; Friedrich K. Levacher, Brauweiler, and Helmut Federmann, Berg. Gladbach, all of Fed. Rep. of Germany, assignors to Philips Kommunikations Industrie A, Hamburg, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,095
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131870
Int. Cl.[4] G01B *11/16*
U.S. Cl. 356—32 4 Claims



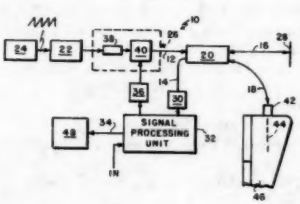
1. A light conduit arrangement for monitoring physical conditions, such as breakage or deformation, of a structural part, comprising at least one light conduit whose breaking elongation is greater than that of the structural part, the light conduit having its terminal portions connectable respectively to a light source and a light receiver, an intermediate portion of the light conduit being secured to the structural part under an initial mechanical stress relative to the structural part, and the initial mechanical stress being selected such that the resulting breaking elongation of the prestressed intermediate portion is less than that of the structural part.

4,840,481

POLARIMETRIC OPTICAL FREQUENCY DOMAIN DISTRIBUTED STRAIN SENSOR AND METHOD

William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision, Tarrytown, N.Y.

Filed Dec. 10, 1987, Ser. No. 131,069
Int. Cl.[4] G01B *11/16*
U.S. Cl. 356—32 12 Claims



1. An apparatus for sensing distributed strain along an optical fiber, comprising:

means for launching frequency varying optical energy hav-

ing a selectively controlled polarization state into an optical fiber subject to strain and for providing a reference signal representative of the modulated optical energy, the polarization state of the optical energy controlled in response to a control signal;

means for mixing a portion of the optical energy backscattered from said fiber with a portion of the reference signal to produce a beat signal, the frequency of which is representative of a strain location along the fiber; and

means for sensing the polarization state of the backscattered optical energy and for controlling the polarization state of the optical energy launched by said first-mentioned means in response to the beat signal provided by said second-mentioned means.

4,840,482

METHOD OF CODED FIBER IDENTIFICATION IN OPTICAL TRANSMISSION NETWORK

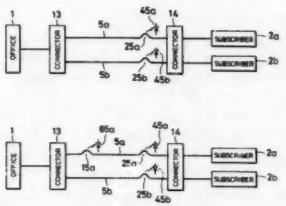
Masayuki Shigematsu, and Shuzo Suzuki, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 15, 1988, Ser. No. 182,022

Claims priority, application Japan, Apr. 17, 1987, 62-95892

Int. Cl.[4] G01N *21/84*

U.S. Cl. 356—73.1 **6 Claims**



1. A method for identifying an aimed coated fiber from a plurality of coated fibers in an optical transmission network at the upstream and downstream ends thereof during transmission of an optical signal comprising the steps of:

bending said coated fibers at downstream end sides thereof far from an optical signal source to produce radiated light from the bent portions thereof;

measuring the first levels of radiated light produced at the downstream end sides;

bending either the coated fiber to be identified or all remaining coated fibers at the upstream end side of the optical transmission network;

measuring the second levels of radiated light produced in the respective fibers at the downstream end side with the plurality of said fibers remaining bent at their downstream end side; and

comparing the second levels of radiated light with the first levels of radiated light to detect variation in the level of radiated light, the aimed coated fiber being identified according to the detected variation.

4,840,483

ALIGNMENT TOOL FOR LASER BEAM DELIVERY SYSTEMS AND METHOD OF ALIGNMENT

James L. Haffner, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 18, 1987, Ser. No. 134,695

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—153 **26 Claims**

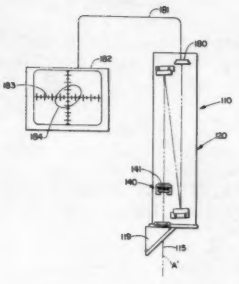
1. An improved tool for use in aligning both angular and translational position of a laser beam at a rotating joint of a laser beam delivery system having one or more rotatable laser optics, said tool comprising:

(a) a tool chassis having means for receiving a laser beam, said laser beam being directed along a laser beam axis to said rotating joint of said delivery system and to said receiving means;

(b) means for mounting said tool chassis on the rotatable part of a rotating joint of the laser beam delivery system to be aligned, said mounting means allowing attachment of said chassis on such rotatable part such that said chassis can be rotated about said joint;

(c) means mounted on said chassis for monitoring the position of a laser beam received relative to a two dimensional coordinate system during rotation of said tool; and

(d) a laser beam focusing lens mounted on said chassis for focusing at least a portion of a laser beam received such that translational deviations of said received laser beam are eliminated from that focused beam, whereby in conjunction with said monitoring means angular orientation



of said received laser beam can be isolated and monitored when passed through said focusing lens, the focused beam tracing a rounded pattern on said monitoring means as said tool chassis is rotated about said joint, wherein angular deviations of said beam at the rotating joint can be corrected by adjusting one or more of the laser optics to center said beam within said rounded tracing pattern, and whereby translational position of said received laser beam can be monitored when not focused by said focusing lens, the unfocused beam similarly tracing a rounded pattern on said monitoring means as said tool chassis is rotated about said joint, wherein translational deviations of said beam can be corrected by centering the unfocused beam within the rounded tracing pattern on said monitoring means, such that both translational and angular errors in said laser beam can be determined and corrected.

4,840,484

ATOMIC ABSORPTION SPECTROPHOTOMETER WITH FURNACE AT PRESSURE EQUAL OR NEAR LIGHT SOURCE PRESSURE

Konosuke Oishi, Mito; Toyoharu Okumoto, Katsuta; Hayato Tobe, Mito, and Masamichi Tsukada, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,320

Claims priority, application Japan, Mar. 30, 1987, 62-76562

Int. Cl.[4] G01N *21/74*

U.S. Cl. 356—312 **7 Claims**

1. An atomic absorption spectrophotometer including:

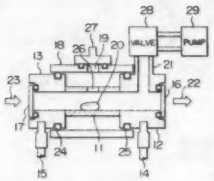
an electric furnace for drying and ashing a liquid sample to be analyzed and then atomizing the sample to generate atomic vapor;

a low-pressure lamp for emitting light having a spectrum of an element to be analyzed onto the atomic vapor atomized in said electric furnace;

a monochromator for splitting the transmitted light from said electric furnace and selecting a wavelength of an

atomic absorption line absorbed by said element to be analyzed; and

a signal processing unit for detecting light having the selected wavelength supplied from said monochromator and for analyzing the element to be analyzed,



wherein said electric furnace comprises: a sealing mechanism for maintaining the inside of said electric furnace airtight; and

an evacuation unit for evacuating the inside of said electric furnace to a pressure equal or near to the pressure of the inside of said lamp.

4,840,485

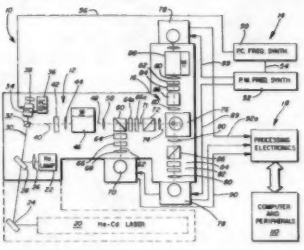
FREQUENCY DOMAIN CROSS-CORRELATION FLUOROMETRY WITH PHASE-LOCKED LOOP FREQUENCY SYNTHESIZERS

Enrico Gratton, Urbana, Ill., assignor to I.S.S. (U.S.A.) Inc., Champaign, Ill.

Continuation of Ser. No. 943,253, Dec. 17, 1986, abandoned. This application Jul. 27, 1988, Ser. No. 225,595

Int. Cl.[4] G01N *21/64*

U.S. Cl. 356—317 **9 Claims**



1. Apparatus for cross-correlation frequency domain fluorometry, which comprises:

a source of electromagnetic radiation;

means for amplitude modulating the electromagnetic radiation at a first frequency;

means for directing the amplitude-modulated electromagnetic radiation at a sample;

means for detecting the luminescence of the sample;

means for providing a signal coherent with amplitude modulated signals produced by said amplitude modulating means, at a second frequency, to said detecting means;

means for modulating the gain of said detecting means by said signal;

said amplitude modulating means and means for providing a signal at a second frequency each comprising a separate phase-locked loop frequency synthesizer;

said second frequency being different from said first frequency by at least 100 hertz; and means for deriving a resultant signal from said electromagnetic radiation and said detecting means at a frequency of the difference between said first and second frequencies, to detect phase shift and modulation changes of said luminescence from that of said electromagnetic radiation.

4,840,486

APPARATUS FOR MEASURING FLOW VECTORS IN GAS CURRENTS

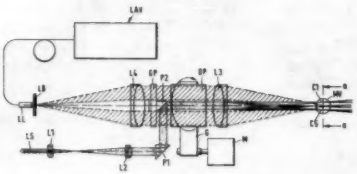
Richard Schodl, Troisdorf-Eschmar, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,578

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631901

Int. Cl.[4] G01N *21/53*

U.S. Cl. 356—338 **25 Claims**



9. An apparatus for measuring the flow vector of a particle contained in gas currents flowing through a plurality of at least three light beams focused onto at least three juxtaposed locations within a measuring volume, comprising:

receiving means for receiving reflections of said at least three light beams, reflected from said particle flowing through said at least three juxtaposed locations;

selecting means for selecting a first and a second light beam from said plurality of at least three light beams;

first signalling means for producing a first signal upon receipt of a reflection of said first light beam; and

second signalling means for producing a second signal upon receipt of a reflection of said light beam.

4,840,487

MEASURING APPARATUS FOR ETCHING PITS

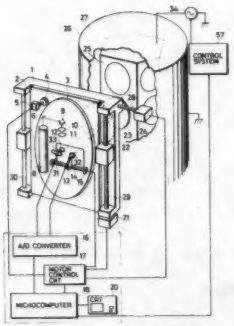
Minori Noguchi, Yokohama; Toru Otsubo, Fujisawa, and Susumu Aiuchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 875,980

Claims priority, application Japan, Jun. 19, 1985, 60-131761

Int. Cl.[4] G01B *11/22*

U.S. Cl. 356—355 **10 Claims**



1. An apparatus for measuring a depth of a fine pit or a fine groove on a substrate, comprising:

working means for forming a fine pit or a fine groove on a semiconductor substrate;

laser source means for generating a laser beam having a wavelength less than a predetermined wavelength so as to be a short wavelength;

optical means for radiating the short wavelength laser beam generated by the laser source means to a surface portion of the semiconductor substrate including at least one pit or groove formed by the working means and in a direction substantially perpendicular to a surface of the semiconductor substrate;

detection means for detecting an intensity of an interference light between light which is reflected by a bottom of the at least one pit or groove and diffracted by an orifice of the at least one pit or groove and light which is reflected and diffracted by the surface portion of the semiconductor substrate other than the at least one pit or groove, the detection means including a detector for converting the detected interference light to an electric signal; and

computing means for calculating a depth of the at least one pit or groove formed by the working means in accordance with a time interval between peaks of the electric signal.

4,840,488

PHOTOELECTRIC TYPE DISPLACEMENT DETECTING INSTRUMENT

Yoshihiko Kabaya, Sagamihara; Naofumi Yasuda, Ichikawa, and Toshihiro Omi, Kawasaki, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

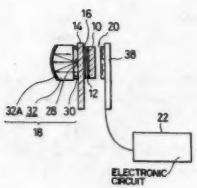
PCT No. PCT/JP87/00154, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO87/05693, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 12, 1987, Ser. No. 86,627

Claims priority, application Japan, Mar. 14, 1986, 61-56534; Mar. 14, 1986, 61-56535; Jun. 25, 1986, 61-149073; Mar. 6, 1987, 62-51517; Mar. 6, 1987, 62-51518

Int. Cl.[4] G01D 5/36

U.S. Cl. 356—374 **14 Claims**



1. A photoelectric type displacement detecting instrument comprising:

a main optical lattice (12) formed on a first member (10) made of a light transmitting material;

an auxiliary optical lattice (16) formed on a second member (14) made of a light transmitting material and movable relative to said first member (10) in a manner to be parallel and adjacent to said main optical lattice (12);

a light emitter (18) for emitting detecting light to both optical lattices (12 and 16) from the outer side of said second member (14) to said first member (10);

a light receiver (20) opposed to said light emitter (18), interposing therebetween both optical lattices (12 and 16), for receiving said detecting light transmitted through the both optical lattices (12 and 16), transducing changes in the value of said received light through the repeat of overlappings due to relative movements between both optical lattices (12 and 16) into electric signals, and outputting same; and

an electronic circuit (22) for processing said electric signals from said light receiver (20) and calculating a relative moving distance between said main optical lattice (12) and said auxiliary optical lattice (16) on the basis of the number of changes in the value of said received light; wherein:

said second member (14) has a phase dividing frame (24) for dividing said auxiliary optical lattice (16);

said light emitter (18) is integrally formed with a light emitting element (28) disposed at the outer side of either one of said first member (10) and said second member (14), a ring-shaped member (30) surrounding said light emitting element (28) and having a height larger in value than the thickness of said light emitting element (28) and a lens member (32) being in contact with the outer surface of said ring-shaped member (30) and having a reflector (32A) for making parallel the light diffused from said light emitting element (28) and reflecting same toward said phase dividing frame (24); and

said light receiver (20) is opposed to said light emitting element (28), interposing therebetween said phase dividing frame (24), and integrally formed therein with photoelectric transducing elements (34A–34D) provided corresponding in number to the number of division of said phase dividing frame (24).

4,840,489

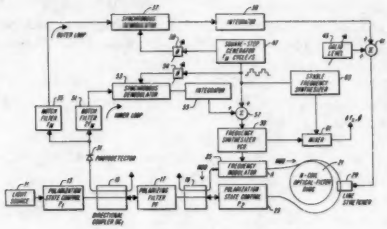
INTERFEROMETER GYROSCOPE HAVING TWO FEEDBACK LOOPS

Joseph D. Coccoli, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 22, 1986, Ser. No. 899,540

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—350 **7 Claims**



1. An interferometer gyroscope for measuring inertial rotation comprising,

an open-ended optical fiber loop, said optical-fiber loop including optical-path length control means for controlling the optical path length of said optical fiber loop in response to an applied optical path length control signal;

a generator for generating a laser beam characterized by a predetermined optical frequency;

coupling means for coupling said laser beam to the opposite terminal ends of said optical-fiber loop such that electromagnetic energy from said beam is propagated through said optical-fiber loop from one end of said optical-fiber loop to the other end of said optical fiber loop in a first direction, and from said other end to said one end in a second direction, said second direction being opposite to said first direction;

a first signal generator for generating a periodic signal at a frequency f_m;

modulating means for modulating the frequency of the said beam transmitted into said one end of said optical-fiber loop in a first direction and for modulating the frequency of the said beam transmitted from said one end of said optical-fiber loop in said second direction;

a modulator control including a means for detecting said counter-propagating electromagnetic energy from the ends of said optical-fiber loop coupled in series with a first demodulator and an integrator establishing a first feedback path between said ends of said optical fiber loop and

said modulator to generate a first control signal for controlling said modulating means to maintain the phase difference between said electromagnetic energy propagated in said optical-fiber loop in opposite directions to be substantially ninety degrees out of phase at said means for detecting;

said first control signal being representative of the sum of said periodic signal and the signal resulting from the demodulation of said detected electromagnetic energy from the ends of said optical-fiber loop at a frequency $2f_m$;

an optical path length control signal generator including means for detecting said counter-propagating electromagnetic energy from the ends of said optical-fiber loop coupled in series with a second demodulator and an integrator establishing a second feedback path between said ends of said optical-fiber loop and said path length control means, said generator providing means for generating said optical path length control signal and for applying said path length control signal to said path length control means whereby the optical path length of such loop is held constant against external disturbance such that said integrated signal is maintained at a predetermined value resulting in stabilization of the scale factor of said gyroscope apparatus;

said path length control signal being representative of the integrated signal resulting from the demodulation of said detected electromagnetic energy from the ends of said loop at a frequency f_m;

the magnitude of said first control signal being indicative of the inertial rotation rate of said loop.

4,840,490

LASER POSITION MEASUREMENT AND ALIGNMENT

David Gabriel, Kingston; David Audus, Marlow, and Norman Strange, Chichester, all of England, assignors to Lasercheck Limited, Burnham, United Kingdom

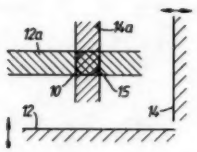
PCT No. PCT/GB85/00565, § 371 Date Sep. 30, 1986, § 102(e) Date Sep. 30, 1986, PCT Pub. No. WO86/03581, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 10, 1985, Ser. No. 902,370

Claims priority, application United Kingdom, Dec. 10, 1984, 8431148; Apr. 22, 1985, 8510218

Int. Cl.[4] G01B *11/26*

U.S. Cl. 356—375 **33 Claims**



1. A target apparatus for detecting the position of a laser beam, comprising:

(a) a body mounted for rotation about an axis, said body having first and second edges lying in plane normal to said axis and extending in angularly spaced-apart relationship with respect to said axis to define therebetween an aperture allowing transmission of a laser beam therethrough, said edges being shaped such that as a function of radial distance from said axis the angular spacing between said edges is a monotonic function of the radial distance,

(b) means for determining a reference position of the body that allows transmission of the laser beam through said aperture,

(c) drive means coupled to said body for reciprocating said body about said axis with respect to said reference position such that the body is turned in a first direction to cause said first edge to intersect the beam and in a second, opposite direction to cause said second edge to intersect the beam, and

(d) means for determining the respective angular positions of said body at said first and second intersections such that the spatial position of the laser beam relative to the target apparatus is determinable from a knowledge of the reference position and of the respective angular positions at said first and second intersections.

4,840,491

RUBBER KNEADING METHOD

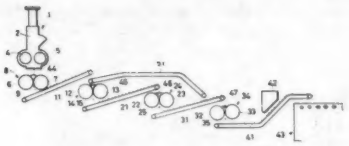
Yoshiaki Hagiwara, Tokyo; Hiromi Ishida, and Takeyoshi Takahashi, both of Tochigi, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,803

Claims priority, application Japan, Aug. 27, 1986, 62-200770

Int. Cl.[4] B29B *1/08*

U.S. Cl. 366—69 **7 Claims**



1. A method of kneading rubber comprising the steps of:

kneading rubber with a kneading mixer;

discharging said rubber thus kneaded from said kneading mixer;

passing said rubber thus discharged through first roll means to form a first rubber sheet having a predetermined thickness;

passing rubber of said first rubber sheet through second roll means to form a second rubber sheet whose thickness is 2 mm or less; and

passing rubber of said second rubber sheet through third roll means to form a third rubber sheet having a desired final thickness;

wherein said predetermined thickness is thicker than 3 mm.

4,840,492

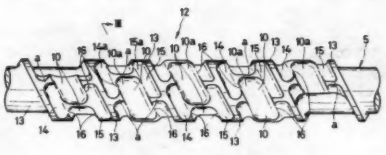
ROTATIONAL SCREW FOR MIXING

Kensaku Nakamura, 272-1 Bessho-cho, Matsubara-shi, Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 185,493

Int. Cl.[4] B01F *7/08*; B29B *7/42*

U.S. Cl. 366—81 **3 Claims**



1. A rotary mixing screw comprising

a circular cylindrical solid rod having on the outer periphery there of

a pair of first recesses arranged substantially parallel to each other and substantially helically about an axis of the rod, said first recesses each forming a triangle having three tips and three rounded sides, each first recess being disposed to have its successive tips spaced at 120° a angle from each other said triangles being formed when considered from a helical cross section;

said outer periphery of said rod having remaining portions adjacent said pair of first recesses; and

a second recess formed between said pair of first recesses and arranged helically about said axis, said second recess forming a triangle with three tips and three rounded sides, with a tip being disposed at 60° angle from the closest tips of said pair of first recesses, said triangle being formed when considered from a helical cross section, said second recess having a wider dimension axially than said pair of first recesses; and

wherein the areas adjacent to the pair of first recesses and said second recess, each have an opening to form a plurality of flow paths.

4,840,493

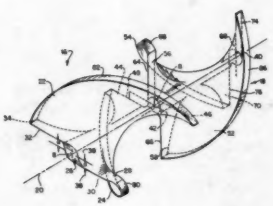
MOTIONLESS MIXERS AND BAFFLES

Terry A. Horner, 143 S. Main, Allenstown, N.J. 08514

Filed Nov. 18, 1987, Ser. No. 121,935

Int. Cl.[4] B01F *5/06*

U.S. Cl. 366—339 **20 Claims**



1. A motionless mixer baffle member having opposed major surfaces and first and second ends, said baffle member being helically twisted symmetrically about a longitudinal axis and being defined by said opposed major surfaces extending along said axis from said first end to said second end of said baffle, said major surfaces being connected together at said first end by a substantially planar surface extending substantially transversely of said axis and lying in a plane substantially parallel to said axis.

4,840,494

CALIBRATED TEMPERATURE SENSOR AND METHOD OF CALIBRATING SAME

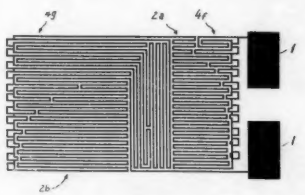
Petr Horn, Oberhasli, Switzerland, assignor to Albert Koch, Einsiedeln, Switzerland

Continuation-in-part of Ser. No. 786,955, Oct. 1, 1985, abandoned. This application Oct. 13, 1987, Ser. No. 106,678

Claims priority, application Switzerland, Feb. 1, 1984, 462/84; Jan. 8, 1985, 54/85

Int. Cl.[4] G01K *15/00, 7/16*

U.S. Cl. 374—1 **4 Claims**



1. A process for calibrating temperature sensors having trimming paths for calibrating purposes comprising the steps of forming a substrate having a plurality of temperature sensors thereon;

stabilizing the temperature of the substrate and sensors at a preselected equilibrium temperature with variations of less than 0.1° C.;

concurrently measuring with a measuring device the temperature-dependent total resistance R_o of all sensors on the substrate;

calculating and selecting a first combination of interruptions of trimming paths based on said measured total resistance R_o for each sensor wherein the calculated theoretical resistance increase expected to result from the selected interruptions approaches the difference between a desired resistance value R_f and the measured initial value R_o;

subsequently interrupting the selected paths in an adjusting device separate from the measuring device;

again stabilizing the temperature of the substrate and sensors at the preselected equilibrium temperature with variations of less than 0.1° C.;

again measuring the resistance R_o of all sensors;

calculating and selecting a second combination of interruptions of trimming paths based on the last measured total resistance R_o for each sensor wherein the calculated theoretical resistance increase is expected to increase the total resistance to the desired resistance value R_f; and

subsequently interrupting the second combination of selected paths in the separate adjusting device, and wherein each said sensor includes a first partial structure having a first plurality of trimming paths having different values for the first interrupting step and a second partial structure having a second plurality of trimming paths having different values for the second interrupting step, the sensor being formed so that interruption of all trimming paths of the first partial structure increases the total resistance R_o by at least 20%, the calculation and selection of the first combination of trimming paths being made such that the total resistance measured after the first interruption of selected paths is less than the final desired resistance value R_f by half the amount of the total possible resistance increase achievable by interrupting all paths in the second partial structure.

4,840,495

METHOD AND APPARATUS FOR MEASURING THE THERMAL RESISTANCE OF AN ELEMENT SUCH AS LARGE SCALE INTEGRATED CIRCUIT ASSEMBLIES

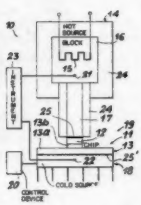
Jean Bonnefoy, Crespieres, France, assignor to Bull S.A., Paris, France

Filed Dec. 29, 1986, Ser. No. 947,265

Claims priority, application France, Dec. 27, 1985, 85 19342

Int. Cl.[4] G01N *27/18;* **G01R** *31/26*

U.S. Cl. 374—43 **11 Claims**



1. In a method for determining the thermal resistance (R3) of an element (11), wherein a temperature (T1) of a hot source and a temperature (T2, T'2) of a cold source are measured, a thermal flux (Q) flowing from the hot source to the cold source is determined, and a thermal resistance (R1, R2) is calculated by applying the formula $R=(T-T2)/Q$, the improvement comprising:

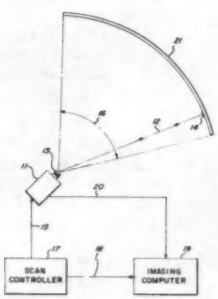
connecting the element (11) to the hot source (14) via a serially connected solid bar (17) having a cross-section at least approximately equal to a facing cross-section of the element, said solid bar being a good thermal conductor;
measuring hot source temperature (T1) and cold source temperature (T2);
determining thermal flux (Q);
calculating a thermal resistance (R1) representative of the bar and the element by applying the formula $R1=(T1-T2)/Q$;
removing the element (11);
moving bar (17) into contact with cold source (18) via an interface (25);
measuring hot source temperature (T1) and cold source temperature (T'2);
determining thermal flux (Q);
calculating a thermal resistance (R2) representative of the bar by applying the formula $R2=(T1-T'2)/Q$; and
calculating a thermal resistance (R3) of the element (11) by subtracting R2 from R1.

4,840,496

NONCONTACT TEMPERATURE PATTERN MEASURING DEVICE

Daniel D. Elleman, San Marino; James L. Allen, La Crescenta, both of Calif., and Mark C. Lee, Rockville, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 23, 1988, Ser. No. 159,613
Int. Cl.[4] G01J *5/00, 5/30*
U.S. Cl. 374—124 **7 Claims**



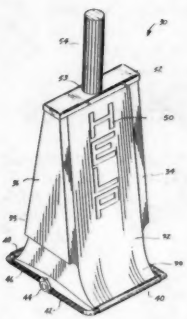
1. A noncontact temperature pattern measuring device for providing the true temperature distribution for a remotely located surface area, said measuring device comprising:
a laser pyrometer means including a high resolution photodetector positioned to receive thermal radiation from said remotely located surface area, a high resolution laser for eradiating a portion of said remotely located surface, and means for detecting at least a portion of the laser signal reflected from said remotely located surface for determining the emissivity of the surface region reflecting the laser signal and compensating the value of thermal radiance for said emissivity;
means for focusing the laser signal, the response of the photodetector to thermal radiation and the response of the laser signal detecting means on a small precise point on the remotely located surface area; and
means for scanning the focused condition created by said focusing means across the entire remotely located surface area, thereby producing a true temperature measurement at each point of focus.

4,840,497

SUNSHADES STORAGE CASE

Sue E. Harber, and James L. Harber, both of 345 Clifton Rd., South Charleston, Ohio 45368

Filed Mar. 11, 1988, Ser. No. 167,102
Int. Cl.[4] B65D *30/10, 33/17*
U.S. Cl. 383—4 **4 Claims**



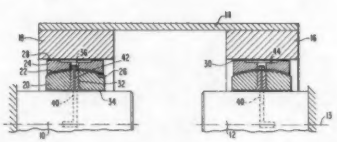
1. A new and improved sunshades storage case for use with an accordion-fold cardboard automobile sunshade, said storage case comprising:
a pair of generally rectangular front and back panels formed from a flexible plastic material;
emergency highway signal markings printed on said front and back panels;
a pair of generally triangular side panels formed from a flexible plastic material;
said side panels secured in opposed parallel relation between said front and back panels;
a cylindrical loop formed at a bottom end of each of said front and back panels;
a U-shaped bar extending through each of said loops;
a pair of hinges pivotally connecting ends of said U-shaped bars adjacent a bottom end of each of said side panels, said U-shaped bars mounting bottom ends of said front and back panels for movement between opened and closed positions;
a generally rectangular top bracket extending transversely across a top end of said front and back panels, said top bracket secured to said front, back, and side panels;
a cylindrical recessed socket centrally formed in a top surface of said top bracket; and
said storage case having a vertical trapezoidal configuration when in said opened position.

4,840,498

SELF-ALIGNING JOURNAL BEARING

Gerhardt E. Lichtfuss, Rockford, Ill., assignor to Sundstrand Corp., Rockford, Ill.

Filed Jun. 28, 1988, Ser. No. 212,574
Int. Cl.[4] F16C *25/04*
U.S. Cl. 384—213 **12 Claims**



1. A self-aligning journal fluid film lubricated bearing having a bushing mounted about a cylindrical surface of a race mem-

ber for relative rotational movement therebetween about a rotational axis comprising:

a ball member having an inner surface and an outer spherical surface portion with a plurality of spaced radial holes positioned in a plane perpendicular to said rotational axis;

a race member having an outer cylindrical surface and an inner spherical surface that is adapted to mate with the spherical surface portion of said ball member, said race member having a plurality of spaced holes extending radially through the race member from the inner to the outer surface, each hole being located in a slot having a major axis lying in a radial plane which passes through said rotational axis and a depth effective to provide a distribution of a lubricating fluid in the form of a film for supporting the rotating load on the bearing during operation;

means for providing a fluid film between an inner surface of said bushing and the outer cylindrical surface of said race member to support the rotating load on the bearing during operation, said means including an orifice associated with said spaced radial holes which meters the required amount of lubricant flow both to the contacting spherical surfaces and to the bushing and race member contacting surfaces; and

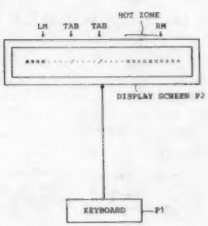
at least one anti-rotation pin tightly fitted in a hole of said ball member and extending into a corresponding hole in said race member to provide a connection allowing small articulating motion but no full rotation between the ball member and the race member.

4,840,499

DISPLAY CONTROL DEVICE FOR A TYPEWRITER WHICH DISPLAYS BOTH INPUT CHARACTERS AND FORMAT INFORMATION

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 8, 1987, Ser. No. 130,169
Claims priority, application Japan, Dec. 9, 1986, 61-293007
Int. Cl.[4] B41J *3/46*
U.S. Cl. 400—83 **5 Claims**



1. A display control device for a typewriter comprising:

input means for inputting character data and format setting data;

format memory means for storing the format setting data;

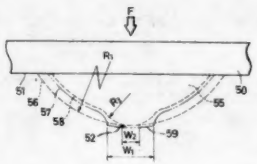
a display unit having a plurality of display positions, each of said display positions being able to display a character corresponding to the character data inputted by the input means; and control means for displaying individual forms, according to the format setting data stored in the format memory means, within each of the display positions before the character data is inputted, and for displaying the character in place of the individual form when the character data is inputted.

4,840,500

THERMAL TRANSFER PRINTER HAVING AN IMPROVED THERMAL HEAD TO IMPROVE INK TRANSFER EVENESS

Akira Sasaki; Yoshihito Takahashi; Akiyoshi Hakoyama, all of Hitachi; Katsumasa Mikami, Ibaraki; Masafumi Suzaki; Takeo Honma, both of Hitachi; Tsuyoshi Yasutomi; Ryoichi Shiraishi, both of Kokubu, and Yasuo Nishiguchi, Kyoto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 23, 1987, Ser. No. 76,849
Claims priority, application Japan, Jul. 30, 1986, 61-177540
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 **6 Claims**



1. For use with a thermal transfer printer having a thermal head, a platen facing said thermal head, and a transfer recording paper for insertion between said thermal head and said platen so that printing is performed; said thermal head including a head substrate member, a graze portion formed projectingly on said head substrate member, and a heating resistor element formed on a crown portion of said graze portion wherein

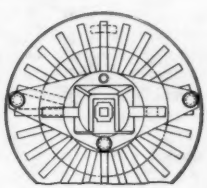
a temperature distribution curve of a surface of said heating resistor element of said thermal head when said thermal head is not pressed against a platen side and a face pressure distribution curve of the surface of said heating resistor element of said thermal head when said thermal head is pressed against the platen side have substantially analogous shapes within a range coextensive with said heating resistor element.

4,840,501

THREE POLE PRINTHEAD ACTUATOR

Kam C. Wong, Canoga Park; Bernard Rubinshtein, Agoura, and Aram Arzoumanian, Woodland Hills, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 857,736, Apr. 29, 1986, abandoned.
This application Mar. 14, 1988, Ser. No. 171,160
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **10 Claims**



1. In a printhead having a series of magnetic actuators arranged in a circular array, an individual magnetic actuator comprising:

a three-pole magnetic actuator having

a single coil wound around a center magnetic pole,

an "E"-shaped core having a length oriented to extend radially in the circular array and defining the three magnetic poles along that length, said three magnetic poles each having a rectangular cross section, and said "E"-shaped core being substantially thin in the circumferential

direction of said circular array of magnetic actuators compared to the length of the core such that said core has a substantially greater dimension in the radial direction of the circular array than in the circumferential direction thereof for enabling twenty-four such individual magnetic actuators to be disposed in a circular array having a diameter of less than 6 centimeters and

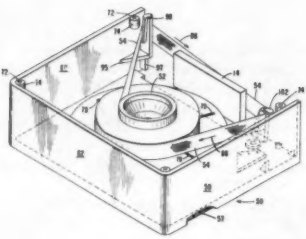
an armature striding over all three magnetic poles.

4,840,502

THERMAL TRANSFER RIBBON CASSETTE

Michael O. Grey, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed May 9, 1986, Ser. No. 861,216
Int. Cl.[4] B41J *32/02*
U.S. Cl. 400—196 **3 Claims**



1. A ribbon cassette for use in a printer and containing an endless ribbon to be unwound from a coil of said endless ribbon, driven past a printing station and then rewound onto the coil of said endless ribbon, said ribbon cassette comprising a

housing portion and a cover portion, a

rotatable plate member supported in the housing portion and comprising a solid bottom flange member and having a plurality of radially extending ribs for supporting the coil of endless ribbon at one elevation in edge-wise manner on said ribs.

means for driving said endless ribbon at an angle past the printing station,

spool means around which the coil of endless ribbon is positioned in an arrangement wherein the endless ribbon is unwound from the inside of said coil of endless ribbon and is rewound on the outside of said coil of endless ribbon, said spool means including a concave-shaped wall portion defining a substantially concave surface on the exterior thereof for containing said coil of endless ribbon thereabout, said solid bottom flange member extending from said concave-shaped wall portion and said radially extending ribs being disposed on the upper surface of said flange member to raise said endless ribbon above the upper surface of said flange member, and

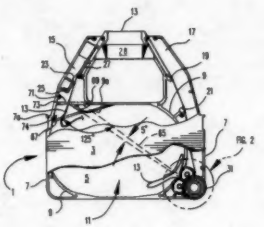
guide means comprising a plurality of plate members integral with said cover portion and positioned around and spaced from the spool means and extending in radial manner from the center of the coil of endless ribbon and spaced upwardly from the ribs on the rotatable plate member for guiding said endless ribbon from the concave surface of the spool means in unwinding of the endless ribbon therefrom and for holding the endless ribbon in a configuration substantially corresponding with the contour of the concave surface in rewinding of the endless ribbon around the coil thereof.

4,840,503

STUFFED CHAMBER RIBBON CARTRIDGE

Sheldon D. Roberts, Versailles; Louann B. Samuels, Scott County, and David T. Shadwick, Lexington, all of Ky., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,893
Int. Cl.[4] B41J *35/28*
U.S. Cl. 400—208 **5 Claims**



1. A ribbon cartridge comprising two pinch rollers, a printer ribbon stuffed in said cartridge by said two pinch rollers, a first chamber into which said ribbon is stuffed, said first chamber having an obstruction wall opposite the direction of stuffing force of said two pinch rollers, a third roller in said cartridge located out of said first chamber linked to one of said pinch rollers to drive said pinch roller to which it is linked by driving movement of said third roller, at least part of said one pinch roller being located between said third roller and said first chamber, a second chamber having an exit slot, and an opening in said first chamber immediately contiguous to said wall opposite said stuffing force, said opening having a dam constricting said ribbon which permits said ribbon to exit said first chamber to be loosely contained in said second chamber and to exit said second chamber in a single strand through said exit slot, said exit slot being on the side of said second chamber near said obstruction wall such that said obstruction wall is substantially straight on a line at an obtuse angle to said direction of stuffing force and said dam is located on a line which is substantially an extension of said line of said wall.

4,840,504

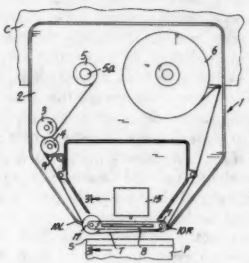
PRINTER RIBBON CARTRIDGE WITH MEANS FOR TRANSVERSELY DISPLACING RIBBON DURING ADVANCE

Mosi Chu, Setauket; Anthony Graziano, Bay Shore, and Kenneth Kress, Huntington, all of N.Y., assignors to Primages, Inc., Del.

Continuation-in-part of Ser. No. 871,369, Jun. 6, 1986, abandoned, Continuation-in-part of Ser. No. 609,784, May 14, 1984, Pat. No. 4,623,271. This application May 11, 1987, Ser. No. 48,237
Int. Cl.[4] B41J *33/56*
U.S. Cl. 400—213 **5 Claims**

1. An ink ribbon cartridge comprising a case, a storage reel for an ink ribbon, a take-up reel for the ink ribbon, means for longitudinally advancing the ink ribbon from the storage reel to the take-up reel, and means supported by the cartridge for transversely displacing the ribbon during its longitudinal advance including a freely rotatable and axially movable first shaft means supported by said case, a first roller fixed to said first shaft means, freely rotatable and axially movable second shaft means supported by said case, a second roller fixed to said second shaft means, coupling means coupling said first and second shaft means for causing said second shaft means to follow the longitudinal movement of said first shaft means, said ribbon passing on said first roller to rotate said first roller during longitudinal advance of the ribbon, said first roller having an end cam surface, the case having a corresponding

cam surface facing and engaging the cam surface on the first roller, said cam surfaces respectively including a plurality of



peaks and an inclined surface between successive peaks to produce a saw-tooth path of travel of the ribbons as the ribbon advances.

4,840,505

ELECTRONIC TYPEWRITER RIBBON LIFT-UP APPARATUS

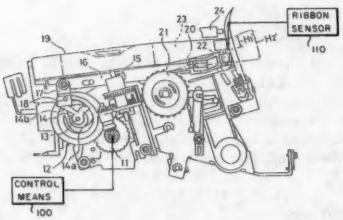
Yasuyoshi Kurokawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 18, 1986, Ser. No. 875,532

Claims priority, application Japan, Jun. 21, 1985, 60-136339

Int. Cl.[4] B41J *29/36*

U.S. Cl. 400—697.1 **4 Claims**



1. An electronic typewriter ribbon lift-up apparatus in which a ribbon cartridge holder vertically mounting a printer ribbon and a correction ribbon is pivotable by a lever mechanism and is engaged with a cam follower pin of a ribbon-lifting disc cam, said disc cam being provided with a printing cam groove and a correction cam groove and being rotatable about a rotation axis from an original position by operation of control means for selective pivoting of the ribbon cartridge holder to one of a printing position and a correcting position, wherein said disc cam has a circular first cam groove for continuous printing operation, a second cam groove for single type printing operation starting from a home position and communicating with the first cam groove, and an arc third cam groove for correcting operation starting from the home position and crossing the first cam groove, said first cam groove having a specified radius with the rotation axis of the disc cam being a center thereof, said third cam groove having a smaller radius than said specified radius of the first cam groove, and wherein a cam auxiliary plate rotatably and coaxially provided on the disc cam comprises a guide portion for the intersection between said first and third cam grooves, and a projection extending at least to the home position to ensure the return of the disc cam to the original position.

4,840,506

PRINTER

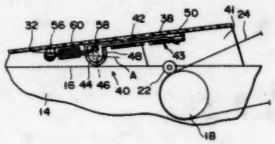
Kazuhiko Kashiwagi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1987, Ser. No. 99,291

Claims priority, application Japan, Sep. 22, 1986, 61-144101[U]

Int. Cl.[4] B41J *11/70, 29/00*

U.S. Cl. 400—621 **12 Claims**



1. A printer comprising:

a main body having an upper opening;

a platen arranged in the main body so as to face the upper opening;

a printing head located in the main body so as to face the platen;

sheet feeding means, arranged in the main body, for supplying continuous paper around the platen;

a cover mounted on the main body to be rotatable between two positions, including a closing position for covering the opening except for a portion above the platen, and an opening position for exposing the opening; and

a cutting mechanism for cutting continuous paper at a predetermined position, said cutting mechanism including: a cutter supported by the cover to oppose the main body, said cutter having a proximal end portion rotatably supported by the cover, and a blade extending from the proximal end portion, said cutter being rotatable between three positions, including a stand-by position where the blade is located above the platen, a cutting position where the blade abuts against the peripheral surface of the platen, and a housing position where the blade is rotated to a position adjacent a side of the cover opposing the platen at times when the cover is in the opening position; and biasing means for biasing the cutter toward the stand-by position when the cutter is located at a predetermined position adjacent the cutting position and for biasing the cutter toward the housing position when said cutter is located at a predetermined position adjacent the housing position.

4,840,507

PRINTER WITH PRINTING SHIELD

Gerard Chenest, Saint Paer, France, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 8, 1988, Ser. No. 165,311

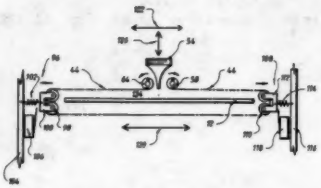
Claims priority, application United Kingdom, Nov. 14, 1987, 8726732

Int. Cl.[4] B41J *11/62*

U.S. Cl. 400—713 **23 Claims**

1. A printer operative to move a printhead along a printing path to leave a readable record on a surface of a presented document maintained on a printing support surface and advanced in the course of presentation and printing; said printing being transverse to the direction of advancement of the document; said printer comprising; a moveable band, supported to pass at a predetermined distance from and parallel to said printing support surface and to pass beneath said printing support surface, said band being operative to accept a document between said band and said printing support surface and to prohibit any portion of the document to exceed said predetermined distance from said printing support surface; said band being coupled to move with said printhead as said printhead

moves along said path; said band permitting said printhead to protrude there-through to print upon the document; and said



printer comprising automatic tensioning means operative to maintain tension in said band.

4,840,508

MECHANICAL PENCIL CAPABLE OF AUTOMATICALLY PROPELLING SUCCESSIVE LENGTHS OF LEAD

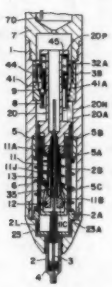
Hiroyuki Watanabe, Hiratsuka, Japan, assignor to Pilot Precision Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 21, 1987, Ser. No. 87,863

Claims priority, application Japan, Jan. 29, 1987, 62-17363; Feb. 23, 1987, 62-25196[U]; Mar. 4, 1987, 62-31557[U]

Int. Cl.[4] B43K *21/22*

U.S. Cl. 401—65 **6 Claims**



1. A mechanical pencil capable of automatically propelling successive lengths of lead, comprising:

(a) substantially tubular body means having a lead storage chamber formed therein for accommodating spare lengths of lead, for use one after another, the body means having a writing end;

(b) a tubular lead guide receiving a length of lead therein and coaxially mounted with the body means so as to partly protrude outwardly thereof from the writing end thereof and engaged by said return spring, the lead guide being resiliently urged to a preassigned normal position with respect to the body means and being retractable relative to the body means from the preassigned normal position in a direction away from the writing end of the body means against the urging force of said return spring with the wear of the lead;

(c) a friction member mounted on the lead guide for engaging the lead so as to normally cause the lead to travel with the lead guide in the axial direction of the body means;

(d) a socket mounted within the body means and having an annular internal taper surface concentric with the body means, the taper surface decreasing in diameter as it extends away from the writing end of the body means;

(e) a chuck disposed intermediate the lead storage chamber and the lead guide and coacting with the socket for releasably gripping the lead, the chuck being displaceable axially of the body means relative to the socket between an open position, closer to the writing end of the body means, for permitting the free passage of the successive lengths of lead therethrough from the lead storage chamber into the lead guide, and a closed position, away from the writing end of the body means, for tightly gripping the lead against axial displacement in a direction away from the writing end of the body means, said chuck being resiliently biased from the open toward the closed position;

(f) chuck opening means disposed within the body means and coupled to the lead guide for joint displacement therewith axially of the body means, the chuck opening means actuating the chuck from the closed to the open position upon displacement of the lead guide from a retracted to the preassigned normal position;

(g) whereby the chuck is held open when the lead guide is in the normal position, permitting a new length of lead to fall therethrough from the lead storage chamber into the lead guide when the lead that has been received in the lead guide wears short;

(h) one-way locking means for permitting the lead guide to retract into the body means with the wear of the lead during writing or marking and for locking the lead guide against displacement toward the writing end of the body means when the mechanical pencil is moved out of contact with a writing or marking surface; and

(i) unlocking means for causing the one-way locking means to permit the lead guide, together with the lead being engaged by the friction member, to travel back to the normal position when the lead is worn to a prescribed degree.

4,840,509

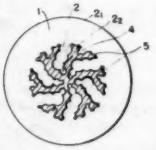
SYNTHETIC RESIN PEN UNIT

Akio Ito, and Hiroshi Kato, both of Aichi, Japan, assignors to Pilot Ink Co., Ltd., Japan

Division of Ser. No. 9,542, Feb. 2, 1987, Pat. No. 4,721,404, which is a continuation of Ser. No. 878,396, Jun. 19, 1986, abandoned, which is a continuation of Ser. No. 202,815, Oct. 31, 1980, abandoned. This application Oct. 15, 1987, Ser. No. 108,675

Int. Cl.[4] B43K *1/12, 1/06, 1/06*

U.S. Cl. 401—198 **3 Claims**



1. A pen unit comprising, in cross-section, a number of synthetic resin elements fused in the axial direction to form a capillary pen nib, said nib having an outer annular cylindrical member and is hollow at its circumferential center, a plurality of curved bent members extending inwardly from said cylindrical member toward said hollow center, said plurality of curved bent members uniformly circumferentially spaced thereon, said nib devoid of any inwardly extending straight members, said curved bent members comprise alternate long and short bent members and said long bent members comprise a base portion bent in a first direction and a top portion which is bent in a second direction and extending toward the central axis of the pen.

4,840,510

CONTAINER WITH BRUSH AND FLUID METERING UNIT FOR FLUID TYPE COSMETICS

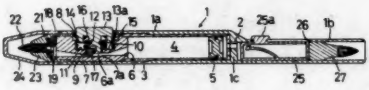
Shigeru Yaita, Saitama, Japan, assignor to Kabushiki Kaisha Yaita Seisakusho, Saitama, Japan

Filed Oct. 27, 1987, Ser. No. 113,116

Claims priority, application Japan, Oct. 29, 1986, 61-165961[U]

Int. Cl.[4] A46B *11/02*

U.S. Cl. 401—149 5 Claims



1. A fluid dispenser for fluid cosmetics comprising:

a housing;

a cosmetics reservoir in said housing for containing fluid cosmetics;

a brush attached to said housing for receiving and distributing fluid cosmetics;

a fluid passage in said housing for fluidly communicating said brush and said reservoir, said fluid passage having an intermediate passage portion having first and second ends, and said fluid passage having a stepped portion; and

a fluid metering means attached to said housing for metering fluid from said cosmetics reservoir through said fluid passage to said brush, said fluid metering means including a pushing unit movably received within said housing, said pushing unit having a first portion extending out of said housing and a second portion for extending into said stepped portion of said fluid passage, said second portion being substantially L-shaped, said fluid metering means further including a movable substantially L-shaped shut-off unit adjacent said second portion and freely movable in the direction for entering said fluid passage for pushing out fluid from said fluid passage toward said brush and for blocking off fluid communication between said brush and said reservoir, said fluid metering means further including a biasing means for urging said first portion of said pushing unit outwardly of said housing, said second portion blocking off fluid communication between said brush and said reservoir when said first portion of said pushing unit is moved inwardly into said fluid passage, said pushing unit then contacting said shut-off unit for moving said shut-off unit into said fluid passage while moving said second portion into said stepped portion of said passage for forcing fluid cosmetics out of said stepped portion toward said brush when said first portion of said pushing unit is moved further inwardly into said fluid passage, said second portion then further moving said shut-off unit into said fluid passage for blocking off fluid communication between said brush and said reservoir, said biasing means then moving said second portion in a return direction out of said stepped portion of said fluid passage when moving said pushing unit outwardly of said housing and said second portion maintaining said fluid passage blocked for developing negative pressure in said stepped portion for drawing fluid cosmetics therein, said biasing means then further moving said second portion in the return direction for unblocking said fluid passage for drawing in fluid cosmetics from said reservoir, and said second portion contacting said shut-off unit for moving said shut-off unit out of said fluid passage for unblocking fluid communication between said brush and said reservoir.

4,840,511

ELONGATED ROLL-ON APPLICATOR PACKAGE WITH RESILIENT LINER

Joseph E. Fattori, Mendham, and Siegbert O. Wagner, Basking Ridge, both of N.J., assignors to The Mennen Company, Morristown, N.J.

Filed Aug. 10, 1987, Ser. No. 84,403

Int. Cl.[4] A45D *34/04*

U.S. Cl. 401—213 7 Claims

1. A roll-on applicator package comprising, in combination, a hollow container for storing a fluid to be dispensed, an integral neck area as part of said container having internal opposing notches and an upwardly and inwardly formed wiping lip, a generally cylindrical roller with hemispherical ends and stub axles protruding along the longitudinal axis of the roller, the roller being larger in cross-sectional area than the cross-sectional area defined by the top edge of the wiping lip, the roller being suspended by the stub axles which engage the notches, a removable cap having attached therein, to the underside of the top portion of the cap, a resilient liner, the cap having a downwardly protruding, integral peripheral rib aligned generally with the top edge of the wiping lip, the resilient liner positioned such that when the cap is in place atop the container, a sealing liner portion of the resilient liner is compressed by the peripheral rib causing the resilient liner to bridge the space between the wiping lip and the roller to form a seal, the cap having slots and the container having detent means for fixing the cap atop the container, the detent means and the slots being dimensionally positioned such that the resilient liner must be compressed before the slots can engage the detent means, the resilient liner comprising a synthetic elastomeric material having a Durometer measurement of 20–35 Shore A.

4,840,512

FITTING FOR FASTENING THE RAIL MEMBER OF A DRAWER

Erich Röck, Höchst, and Helmut Hollenstein, Lustenau, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Dec. 15, 1987, Ser. No. 134,304

Claims priority, application Austria, Jan. 8, 1987, 20/87

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—22 5 Claims

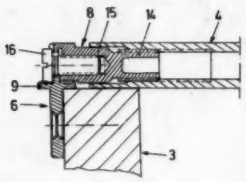
1. A fitting for fastening a rail member of a drawer to a rear wall or a side wall of the drawer, said fitting comprising:

a supporting member to be fastened to the rear wall or side wall of the drawer, said supporting member having therein an open-ended slot;

a fastening member having means for threadably, rotatably

connecting said fastening member to a rear end of the rail member for adjustment relative thereto;

a clamping screw extending through said slot in said supporting member and threaded into said fastening member; and



means on said fastening member for, upon turning of said clamping screw to clamp said supporting member between said clamping screw and said fastening member, preventing turning of said fastening member relative to said supporting member.

4,840,513

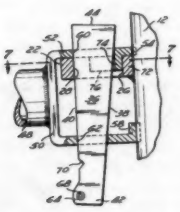
SCAFFOLDING CONNECTOR APPARATUS

Steven B. Hackett, 17822 Arbor La., Irvine, Calif. 92705

Filed Nov. 5, 1986, Ser. No. 927,661

Int. Cl.[4] F16B *7/00*; E04G *7/00*

U.S. Cl. 403—49 **31 Claims**



1. An apparatus for removably connecting a vertically upright first member and a second member, said apparatus comprising:

a plate surrounding said first member, at least one aperture extending through said plate, said aperture being tapered in a first direction and having a narrow end and a wide end along said first direction;

a first leg extending from said second member and adapted to rest on top of said plate;

a tooth depending from said first leg, said tooth extending into said aperture and being tapered in said first direction to conform in size and shape to said narrow end of said aperture; and

means for forcing said tooth into said aperture narrow end along said first direction so as to prevent rotation of said second member in a horizontal plane about said first member.

4,840,514

MANHOLE ASSEMBLY WITH T-SHAPED HINGE

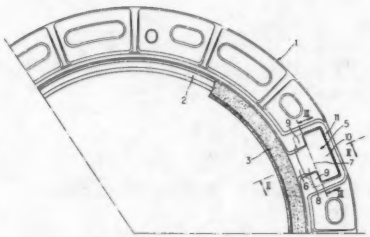
Andre Defrance, Pont A Mousson, and Jean-Claude Hauer, Saulxures les Nancy, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Apr. 7, 1988, Ser. No. 178,932

Claims priority, application France, Apr. 7, 1987, 87 04885; Dec. 16, 1987, 87 17571

Int. Cl.[4] E02D *29/14*; E05D *7/10*

U.S. Cl. 404—25 **12 Claims**



1. A manhole assembly, comprising:

(a) a generally circular frame (**1**, **1'**),

(b) a generally circular cover (**4**) seated within the frame and removably hinged thereto by pivot means comprising:

(c) a T-shaped hinge lug (**16**) extending radially outwardly from a peripheral edge of the cover and defined by a radial neck (**17**) and a cylindrical pivot shaft (**18**) transverse to the neck and having a flattened upper surface (**19**), and

(d) a T-shaped receptacle (**5**, **5'**) recessed in an upper edge of the frame, configured to receivingly accommodate the hinge lug, and defined by a radial neck (**6**) extending outwardly from an inner edge of the frame, a transverse trough (**7**, **7'**) having a greater depth than the receptacle neck, and a pair of retaining lips (**9**) individually overhanging opposite ends of a radially innermost region (**8**) of the trough such that said lips are disposed at opposite sides of said radial neck, wherein:

(e) said innermost region of the trough has an inwardly facing concave shape of greater diameter than a maximum diameter of the pivot shaft taken parallel to the flattened upper surface thereof,

(f) inner edges of the lips define openings in cooperation with an external wall (**11**) of the frame above opposite ends of the trough and above a radially outermost region (**10**) thereof.

(g) a maximum diameter of the pivot shaft taken perpendicular to the flattened upper surface thereof is less than the width of said openings to enable the removal of the cover from the frame when the cover is raised to a vertical position, and

(h) the hinge lug lies out of engagement with surfaces of the receptacle when the cover is closed to avoid metallic rocking and clanking noises upon the passage of a vehicle.

4,840,515

SUBTERRANEAN DRAIN

James S. Freese, Charlotte, N.C., assignor to Mirafi, Inc., Charlotte, N.C.

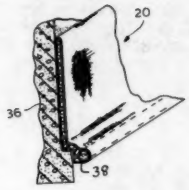
Filed Dec. 5, 1986, Ser. No. 938,507

Int. Cl.[4] E02B *11/00*

U.S. Cl. 405—45 **9 Claims**

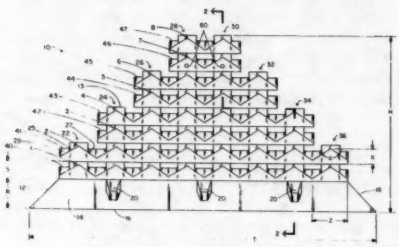
1. A subterranean drainage unit for protecting a structure by intercepting subsurface fluid flows, comprising a sheet base member having parallel first and second planar surfaces, regularly spaced discrete frusto-conical members projecting from said first planar surface members intersecting channels to allow for lateral and vertical uninterrupted flow of fluid, said second

planar surface being constructed and arranged to cohesively adhere to the surface of said structure being protected and a



filter media supported by said projections to maintain a substantially rigid surface which is non-interfering with the flow of fluid within said intersecting channels.

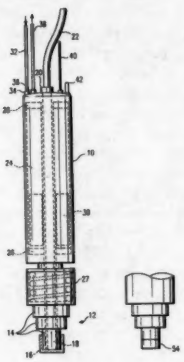
4,840,516
ARTIFICIAL REEF
Thomas A. Rambo, 155 Lake Ave., Riverhead, N.Y. 11901
Filed Oct. 7, 1988, Ser. No. 254,814
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—33 **19 Claims**



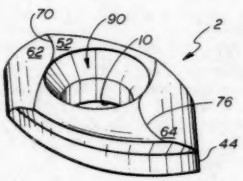
1. An artificial reef, comprising:
a plurality of aligned adjacent blocks;
each of said blocks including a base having front and back walls connected by sidewalls, an upper surface and a bottom surface;
a plurality of generally vertical columns spaced along said upper surface of said base;
said columns being sequentially stepped in height from said front and back walls to a maximum height adjacent a mid-portion of said base;
and
columns of each pair of adjacent blocks having complementary aligned surfaces forming a plurality of intersecting passages extending in first and second perpendicular directions, each of said passages having a corrugated internal surface.

4,840,517
SOIL DISPLACEMENT TOOLS
Roger A. Bullivant, Burton-on-Trent, England, assignor to Roger Bullivant of Texas, Inc., Grand Prairie, Tex.
Filed Feb. 27, 1987, Ser. No. 19,883
Claims priority, application United Kingdom, Feb. 28, 1986, 8605009
Int. Cl.[4] E02D *5/36*
U.S. Cl. 405—241 **12 Claims**

1. A soil displacement tool comprising:
an elongate body having a cylinder formed therein,
a piston moveable in the cylinder, fluid supply and exhaust lines in the cylinder and valve means for causing the piston to selectively impact one or other end of the cylinder to move the tool, the piston and cylinder being annular with the piston having a longitudinal bore therethrough along its longitudinal axis with a central longitudinal passage formed through the piston and through the tool.



4,840,518
CUTTING INSERT
Lawrence Plutschuck, and James E. Ochenski, both of Warren, Mich., assignors to GTE Valenite Corporation, Troy, Mich.
Filed Dec. 27, 1988, Ser. No. 290,599
Int. Cl.[4] B23C *5/02*
U.S. Cl. 407—113 **13 Claims**



1. A cutting insert having a longitudinal axis, a vertical axis and a horizontal axis, comprising:
a planar bottom surface;
a first side surface extending vertically from said planar bottom surface to a first juncture and lying in a first plane which forms a first regular concave curve relative to said vertical axis;
a second side surface opposite said first side surface and extending vertically from said planar bottom surface to a second juncture and lying in a second plane which forms a second regular concave curve relative to said vertical axis;
a first cutting edge face extending at a first angle away from said vertical axis, said first cutting edge face extending from said first juncture to a first cutting edge;
a second cutting edge face extending at a second angle opposite to said first angle and away from said vertical axis, said second cutting edge face extending from said second juncture to a second cutting edge;
a third side surface extending at a third angle away from said vertical axis, said third side surface extending from said planar bottom surface;
a fourth side surface extending at a fourth angle opposite to said third angle and from said vertical axis, said fourth side surface extending from said planar bottom surface;
a top surface extending from said first cutting edge to said

second cutting edge and lying in a third plane which forms a third regular concave curve relative to said planar bottom surface;

a first upper corner area generally extending angularly upward relative to said planar bottom surface in a first longitudinal direction from said first cutting edge towards said second cutting edge, and in a first horizontal direction from said top surface to said fourth side surface, said first upper corner area lying in a fourth plane which is concave relative to said planar bottom surface and which is generally tangent to said top surface;

a diagonally opposite second upper corner area generally extending upward relative to said bottom surface in a second longitudinal direction opposite said first longitudinal direction from said second cutting edge towards said first cutting edge, and in a second horizontal direction from said top surface to said third side surface, said second upper corner area lying in a fifth plane which is concave relative to said planar bottom surface and which is generally tangent to said top surface;

said top surface, said first upper corner area and said first cutting edge face intersecting to form said first cutting edge as a first irregular curve concave relative to said vertical axis, and said top surface, said second upper corner area, and said second cutting edge face intersecting to form said second cutting edge as a second irregular curve concave relative to said vertical axis.

4,840,519

DRILL BIT FOR HAND DRILLS

Werner Kleine, Achim, Fed. Rep. of Germany, assignor to Gebruder Heller GmbH. Werkzeugfabrik, Achim-Uphusen, Fed. Rep. of Germany

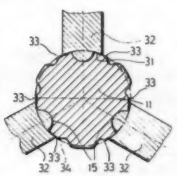
Continuation of Ser. No. 684,031, Dec. 20, 1984, abandoned. This application Jun. 24, 1987, Ser. No. 65,944

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 8337365[U]; Apr. 10, 1984, 3413432

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[4] B23B *31/04, 51/02*

U.S. Cl. 408—226 **13 Claims**



1. A set of drill bits of different thickness, wherein each drill bit has a drill shank and a clamping shank which has a longitudinal axis and a circumferential surface, and wherein the circumferential surface of one drill bit is larger than the circumferential surface of another drill bit, the circumferential surface of each drill bit being interrupted by at least two angularly spaced and generally longitudinally extending grooves, each of said circumferential surfaces having at least one formation which adjoins each of said grooves, each said formation being a surface other than concentric about the longitudinal axis of the involved drill bit, and the sectional profile of each groove and its associated formation surface being identical for all drill bits of said set.

4,840,520

MOUNTING DEVICE HAVING A CONICAL SHANK

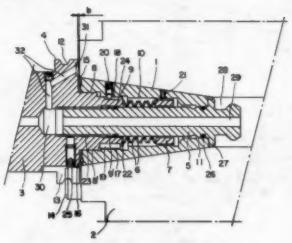
Emile Pfalzgraf, 7, rue de Neuwiller, 67330 Bouxwiller, France

Filed May 19, 1988, Ser. No. 197,123

Claims priority, application France, Nov. 23, 1987, 87 16604; European Pat. Off., Dec. 21, 1987, 87440086.4

Int. Cl.[4] B23C *9/00*; B23B *31/00*

U.S. Cl. 409—232 **14 Claims**



1. Mounting device having a conical shank, with conical and butt contact for attachments, tool holders and tools, comprising a cone (**1**) for introduction into a spindle (**2**), a forward part (**3**) separate from and centered in a bore in the cone (**1**) and provided with a collar (**4**) for application against the face of the spindle (**2**), a pull rod (**5**) for interconnecting the cone (**1**) and the forward part (**3**), a resilient assembly (**6**) for pressing the cone (**1**) into the spindle (**2**) in locking position, mounted in compression between the cone (**1**) and the forward part (**3**), and means (**7**) for adjusting said pressing assembly (**6**).

4,840,521

ELEMENT FOR FILTERING STRESS VARIATIONS IN A BOLTED ASSEMBLY

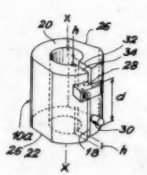
Bernard Bonnet, Eaubonne, France, assignor to Framatome, Courbevoie, France

Continuation of Ser. No. 830,794, Feb. 19, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 110,628

Claims priority, application France, Feb. 19, 1985, 8502360

Int. Cl.[4] F16B *31/12*; G01L *1/04*

U.S. Cl. 411—14 **6 Claims**



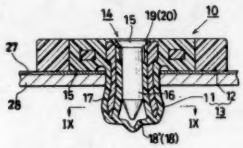
1. A filtering element for filtering stress variations in a bolted assembly, the assembly having first and second members, each having at least one facing hole, a threaded member passing through said holes and a nut screwed onto a screw, wherein the filtering element constituted by a generally elongated tube whose height H is at least 0.8 times its diameter, which surrounds the screw and has a bearing surface on one face of one of the first and second members and bearing surface on one face of the nut, said two bearings surfaces being interrupted by a slot which completely transverses the tube in accordance with a generally longitudinal directional section thereof, a displacement h being provided on each of the bearing surfaces located respectively on either side of said slot, these two displacements being in opposite directions in accordance with the longitudinal direction of the element, the tube having two flats formed symmetrically with respect to a plane passing through the axis of the tube and through the longitudinal slot.

4,840,522

SYNTHETIC RESIN RIVET

Kazumasa Kurihara, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Oct. 27, 1987, Ser. No. 112,977
Claims priority, application Japan, Oct. 29, 1986, 61-164947
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—44 5 Claims



1. A synthetic resin rivet for disposition within an aperture defined within a panel, comprising:

a rivet body having a hollow cylindrical portion and an integral flange portion extending radially outwardly from the upper end of said cylindrical portion for engaging a surface of said panel when said rivet is disposed within said panel aperture; and

a pin for spreading hollow cylindrical portion of said rivet body when inserted thereinto,

said rivet body having a double-layer structure constituted by hard and soft synthetic resins, with at least an outer layer of said hollow cylindrical portion of said rivet body comprising said soft synthetic resin and an inner layer of said hollow cylindrical portion of said rivet body comprising said hard synthetic resin for uniformly radially expanding said outer soft synthetic resin into sealing engagement with sidewall portions of said aperture defined within said panel when said pin is inserted into said hollow cylindrical portion of said rivet body; and an expansible, plastically deformable, substantially U-shaped cap member integrally formed upon the lower end of said hollow cylindrical portion of said rivet body for closing the lower end opening of said hollow cylindrical portion of said rivet body and being constituted of said soft synthetic resin for counteracting contractual tendencies of said soft synthetic resin outer layer of said hollow cylindrical portion of said rivet body away from said sidewall portions of said aperture defined within said panel in order to maintain said sealing engagement thereof by substantially flattening out from said U-shaped configuration when said hollow cylindrical portion of said rivet body is radially expanded as a result of said insertion of said pin into said hollow cylindrical portion of said rivet body.

4,840,523

SECURING DEVICE

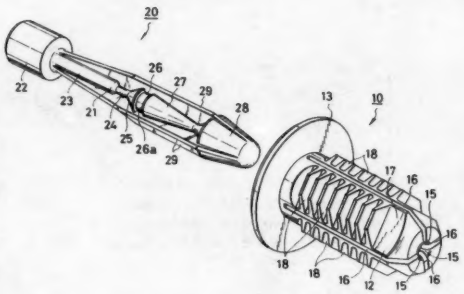
Tsutomu Oshida, Kamagaya, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Jun. 30, 1988, Ser. No. 213,851
Claims priority, application Japan, Jul. 16, 1987, 62-109351
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—48 4 Claims

1. A securing device to be inserted within holes defined within at least two plates to be secured together, comprising:

an outer cylinder having a hollow cylindrical portion with a flange provided at one end, an inwardly projecting portion provided at the other end, a plurality of slits open at said other end and extending axially toward said flanged end so as to divide said hollow cylindrical portion into four quadrants with the outer surface of each quadrant comprising a flat surface disposed substantially perpendicular to the outer surface of each adjacent quadrant, and a plurality of axially spaced engagement ribs, each having the configuration of a trapezoid, projecting outwardly from each of said flat outer surfaces of said quadrants of said cylindrical portion such that the outermost edge surfaces of said trapezoidal ribs are disposed parallel to said flat surfaces of said quadrants of said cylindrical portion whereby each one of said outermost edge surfaces of said trapezoidal ribs are disposed substantially perpendicular with respect to adjacent outermost edge surfaces of said trapezoidal ribs so as to provide the ribbed portion of said outer cylinder with a first substantially square-shaped configuration; and

an insertion member having a rod-like portion to be inserted into and movable within said outer cylinder, said rod-like portion having a head portion provided at one end, an intermediate large diameter portion having an outer diameter which is greater than the inner diameter of said inwardly projecting portion of said outer cylinder so as to



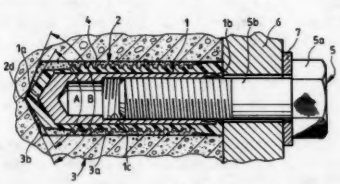
be engaged by said inwardly projecting portion of said outer cylinder in order to radially expand said quadrant portions of said outer cylinder so as to cause said ribs to engage an inner peripheral surface of at least one of said holes of at least one of said plates to be secured together when said insertion member is disposed at a first axial position with respect to said outer cylinder, and a small diameter portion interposed between said large diameter portion and said head portion and having an outer diameter which is smaller than the inner diameter of said inwardly projecting portion of said outer cylinder so as to permit said securing device to achieve a released state with respect to said plates to be secured together when said insertion member is disposed at a second axial position with respect to said outer cylinder.

4,840,524

ANCHOR MEMBER WITH ELECTRICAL INSULATION JACKET

Heinz Bisping; Erich Leibhard, both of Munich, and Peter Mauthe, Kelinberghofen, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft

Filed May 18, 1988, Ser. No. 195,209
Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716703
Int. Cl.[4] F16B *39/02;* E21D *20/02*
U.S. Cl. 411—82 13 Claims



1. Anchor member securable in a hardenable mass in an axially extending borehole in a receiving material, comprising an axially extending metal core member having a leading end in the direction said anchor member is inserted into the borehole and a trailing end, said core member having an axially

extending connecting thread, a jacket enclosing said core member in the axial direction thereof from the leading end at least for an axially extending section toward the trailing end, said jacket is formed of an electrically non-conductive plastics material at least in an axially extending section of said jacket to be located within the receiving material, wherein the improvement comprises a stop centered at the leading end of said jacket on an extension of the axis of said core member and said stop arranged to abut at the base of the borehole approximately along the axis of the borehole, said stop is a conically-shaped tip on the leading end of said jacket with the apex of said tip located approximately on the projection of the axis of said core member.

4,840,525

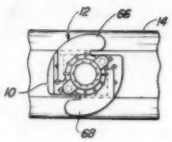
FASTENER RESTRAINER FOR FRAMING SYSTEM

Hugo E. Rebentisch, Garden City, Mich., assignor to Unistrut International Corp., Ann Arbor, Mich.

Filed Dec. 9, 1987, Ser. No. 130,807

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—85 **7 Claims**



1. A fastener for use in joining the members comprising a nut having an opening adapted to engage a mating member, said fastener being adapted to be engaged with a channel-shaped member having a pair of parallel lip-like portions defining a slot;

said fastener including a retainer, said retainer being attached to said nut;

said nut having a major axis and a minor axis and having a groove extending transversely adjacent each of the opposite ends of said nut along said major axis adapted to frictionally engage lip-like portions of said channel member;

said retainer being formed of a resilient deformable mateial and comprising a base secured to said nut along a horizontal plane of said base and having an opening aligned with said opening in said nut;

said retainer having a pair of wing members extending outwardly from said base and upwardly at an angle with respect to the horizontal plane of said base, each wing member including a first section attached to and projecting downwardly from said base transversely of the major axis of said nut a substantial distance beyond a side of said nut;

said wing members each including a second section extending outwardly at said base and transversely of said major axis of said nut a shorter distance than said first sections and parallel to one of said grooves;

said second sections each terminating at a vertical plane containing one of said grooves;

said wing members extending outwardly from opposite sides of said base and being spaced from each other.

4,840,526

GRIPPING DEVICE FOR TENSIONING SCREWING ELEMENTS

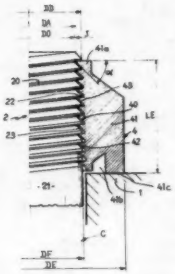
Jean-Claude Bourdonné, Le Breuil, France, assignor to Framatome, Courbevoie, France

Filed Apr. 16, 1987, Ser. No. 39,125

Claims priority, application France, Apr. 17, 1986, 86 05552

Int. Cl.[4] F16B *39/28, 39/30*

U.S. Cl. 411—263 **4 Claims**



1. Gripping device for tensioning a screwing element (2,3) having a free end, said free end having an outer profile (20,30) complementary to an inner profile (40, 50) of an engaging member (4, 5), said outer profile comprising teeth of constant pitch whose mean diameter is generated by a truncated cone and a generatrix of whose outer diameter is parallel to the axis of said screwing element (2, 3), said inner profile (40, 50) comprising teeth of constant cross-section and of a constant pitch slightly larger than that of said screwing element (2, 3) and generated on a conical bore of the same conicity as said mean diameter of said outer profile (20, 30) of said screwing element, said engaging member being provided with a bearing zone (41c, 51c) which supports and transmits forces and which is located on a peripheral portion of said engaging member.

4,840,527

EXPANSION DOWEL ASSEMBLY

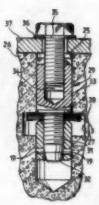
Hans Gschwend, Mauren; Hans Hachtel, Schaanwald, and Werner Wanger, Mauren, all of Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 22, 1987, Ser. No. 136,551

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643911

Int. Cl.[4] F16B *21/00*

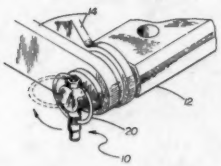
U.S. Cl. 411—344 **12 Claims**



1. An expansion dowel assembly for insertion into a bore hole formed in a hard receiving material, with the assembly having a leading end inserted first into the bore hole and a trailing end with an insertion direction extending from the trailing end to the leading end direction and comprising expansion members displaceable radially outwardly by elastic force,

an axially extending sleeve-like support bearing having a leading end and a trailing end relative to the insertion into the bore hole, load engagement means in said support bearing, said support bearing located closer to the leading end of said expansion dowel assembly relative to said expansion members, a detachable tension member retaining said expansion members on said support bearing in a radially inwardly displaced position, wherein the improvement comprises said expansion members are radially slotted annular disks formed of a spring plate material positioned in the radially inwardly displaced position between said support bearing and said tension member and being releasable into a radially outwardly displaced position by the removal of said tension member, said tension member comprises a shaft elongated in the trailing end-leading end direction and a sleeve fitted on said shaft and secured by noses on said shaft at the trailing end thereof, and said sleeve having conically-shaped outside surfaces supporting said annular disks in the radially inwardly displaced position with said annular disks located between said conically-shaped supports and the trailing end of said bearing support with the trailing end of said bearing support forming a conically-shaped surface supporting the leading ends of said annular disks.

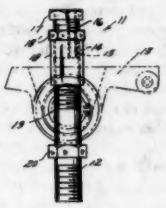
4,840,528
LOCKING HITCH PIN ASSEMBLY
Harvey A. Doom, Rte. 2, Box 168A, Smithland, Ky. 42801
Filed Feb. 16, 1988, Ser. No. 155,735
Int. Cl.[4] F16B *21/02*
U.S. Cl. 411—351 **7 Claims**



1. A locking hitch pin assembly comprising:
a locking pin having first and second ends;
a head being provided at said first end;
a pull ring rotatably retained by said head to allow swinging movement toward and away from said second end of said locking pin; and
means for retaining said pull ring in said pin adjacent said second end, said retaining means being retractable within said locking pin and including a keeper notch for capturing said pull ring;
whereby when said pull ring is pivoted to come into engagement with said pin, said ring being positively retained and held therein.

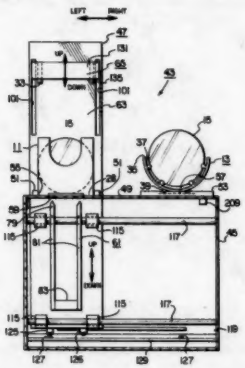
4,840,529
ADJUSTMENT LOCK
Donald A. Phillips, 2909 S. Logan, Lansing, Mich. 48910
Filed Aug. 17, 1987, Ser. No. 85,758
Int. Cl.[4] F16B *23/00, 35/00*
U.S. Cl. 411—397 **2 Claims**

1. A jam lock security structure for rocker arms in adjustment of valve lash clearance, the combination comprising:
a threaded stud;
a threaded sleeve threadably moveable and locatable on the axis of said stud;
a threaded jam element threadably insertable and removable from said threaded sleeve and axially engageable against the end of said stud at a position established by the position of said sleeve and said jam element defining a threaded opening offset from the and parallel to the axis of said jam element; and
a threaded set screw selectively positionable in said opening offset from said axis of said jam element and engageable with said stud upon final positioning of said sleeve element



by said jam element and stress locking said jam elements in selected position.

4,840,530
TRANSFER APPARATUS FOR SEMICONDUCTOR WAFERS
Loc H. Nguyen, 1617 Whittenburg, Fort Worth, Tex. 76134
Filed May 23, 1988, Ser. No. 197,682
Int. Cl.[4] B65G *65/30*
U.S. Cl. 414—404 **4 Claims**



1. An apparatus for automatically transferring wafers between first wafer container means and second wafer container means, said wafers being used in the manufacture of integrated circuits, each of said wafers having a center of gravity and an edge surface, said first container means having two opposite sides with a plurality of parallel slots for receiving said wafers by their edge surfaces and having an open bottom and an open top, said second container means having longitudinal support means with a plurality of parallel slots for receiving said wafers by their edge surfaces and having a closed bottom and an open top, comprising:
(a) first transfer means for transferring said wafers to and from said first container means, said first transfer means entering said first container means through said open bottom of said first container means, said first transfer means having a plurality of parallel slots for receiving said wafers by their edge surfaces and contacting said wafers at points below their centers of gravity;
(b) second transfer means for transferring said wafers to and from said second container means and for transferring said wafers to and from said first transfer means, comprising retainer means and movement means;
(c) said retainer means for retaining said wafers in the same relative orientation with respect to one another when said

wafers are removed from a container means, said retainer means having first and second retainer wall means for supporting said wafers, each of said first and second retainer wall means each having a lower edge and an inside surface, said first and second retainer wall means oriented relative to one another such that said inside surfaces face each other, each of said first and second retainer wall means inside surfaces having a plurality of parallel slots for receiving said wafers by their edge surfaces;

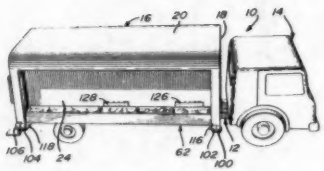
(d) said first and second retainer wall means pivotable relative to one another between open and closed positions, said closed position being where said first and second retainer wall means contact said wafer edge surfaces at points located below the centers of gravity of said wafers, said open position being where said first and second retainer wall means are out of contact with said wafer edge surfaces and said retainer wall means can be inserted or removed from said second container means, said first and second retainer wall means pivotable between open and closed positions when said lower edges of said retainer wall means are inside of said second container means.

4,840,531

VEHICLE FOR CURBSIDE COLLECTION OF SOURCE SEPARATED RECYCLABLE MATERIALS

Maurice J. Dinneen, Scarborough, Canada, assignor to The Corporation of the City of Toronto, Toronto, Canada

Filed Jun. 10, 1988, Ser. No. 205,179
Int. Cl.[4] B65F *3/04*
U.S. Cl. 414—409 **5 Claims**



1. A vehicle for curbside collection of source separated recyclable materials comprising:

a wheel-supported understructure having front and rear sections;

a driver compartment mounted to said front section of said understructure;

a dumping unit mounted to said rear section of said understructure; said unit including a box-like frame having a front wall, a rear wall, spaced side walls, and a top wall, and displaying therein a plurality of longitudinally spaced dividing walls defining a first series of compartments;

a vertically movable trough extending longitudinally of said frame along one side wall thereof; said trough displaying therein a plurality of longitudinally spaced dividing walls defining a second series of compartments to receive source separated recyclable materials;

means on said unit for vertically guiding said trough along said one side wall; said guiding means allowing said trough to move to an upper discharging position over said side wall whereby recycling materials collected in each compartment of said trough are dumped into a corresponding compartment of said box-like frame;

actuatable means mounted between said frame and said understructure for moving said frame relative to said understructure;

hinge points on said frame and said understructure, located at the lower portion of each said side wall;

removable retaining means receivable in each said hinge point and cooperating with said actuatable means to tilt said frame about those hinge points from which said retaining means are not removed;

latchable door means at the bottom of each compartment of said frame allowing said materials to be discharged therefrom when said frame is tilted; and

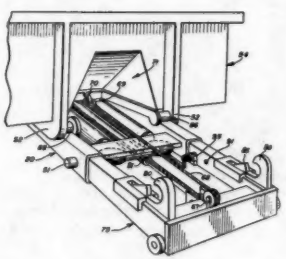
said top wall extends over said series of compartments and is disposed a distance above said one side wall to allow said trough to move to said upper discharge position.

4,840,532

ROLL-OFF HOIST FOR VARIABLE POSITIONING OF CONTAINERS

Donald E. Galbreath, Winamac, Ind., assignor to Galbreath Incorporated, Winamac, Ind.

Continuation-in-part of Ser. No. 835,186, Mar. 3, 1986, abandoned. This application Aug. 14, 1986, Ser. No. 896,759
Int. Cl.[4] B60P *1/04*
U.S. Cl. 414—479 **19 Claims**



1. A vehicle mounted roll-off hoist for loading, transporting and unloading containers of various sizes, each container having stop means and cable hitch means at its forward end, said hoist comprising, in combination:

a roll-off hoist frame comprising a pair of laterally spaced beams secured together by spaced apart cross members;

hinge means adjacent the rearward end of said hoist frame adapting said hoist to pivot on the vehicle between a horizontal position and a rearwardly inclined position;

a container stop carriage telescopically connected with the forward end portion of said hoist frame;

stop means on said carriage engageable with coacting stop means on a container;

fluid actuator means interposed between said stop carriage and said hoist frame adapted to locate said stop carriage at predetermined distances from said hoist frame to place each container in the most favorable position on the vehicle for transport while said hoist frame is in the horizontal position; and

a hydraulic interlock valve mounted between the vehicle and said hoist and operable to preclude operation of said fluid actuator means unless said hoist is in the horizontal position relative to the vehicle.

4,840,533

APPARATUS FOR TRANSPORTING LOADS

Karl-Heinz Althoff, Bad Oeynhausen, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel AG, Dortmund, Fed. Rep. of Germany

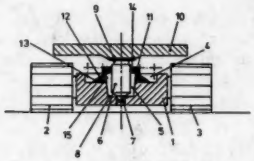
PCT No. PCT/EP86/00641, § 371 Date Aug. 24, 1987, § 102(e) Date Aug. 24, 1987, PCT Pub. No. WO87/03863, PCT Pub. Date Jul. 2, 1987

PCT Filed Nov. 7, 1986, Ser. No. 112,510

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546106

Int. Cl.[4] B65G *41/00*

U.S. Cl. 414—495 9 Claims



1. An apparatus for transporting load units comprising:

a drive system carrier for lifting the load unit;

a single essentially vertically extending lifting element operatively associated with said drive system carrier;

a lifting platform supported by said lifting element;

at least two variable length supporting elements provided between said drive system carrier and said lifting element so as to displace said lifting platform transverse to the lifting direction; and

an element having a tapered inner diameter and being attached to said drive system carrier, said tapered inner diameter being tapered toward said drive system carrier thereby forming an inner wall which acts as an abutment surface for said lifting element upon lateral displacement of said lifting platform.

4,840,534

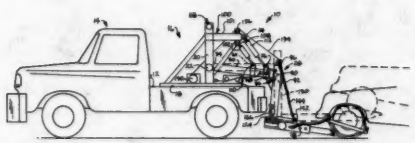
AUTOMOBILE LIFT AND TOW HOIST

Jerry Totty, Rte. 2, Box 54, Chaffee, Mo. 63740

Filed Nov. 24, 1987, Ser. No. 124,598

Int. Cl.[4] B60P *3/12*

U.S. Cl. 414—563 16 Claims



1. A hoist for lifting and towing an automobile using a tow truck or similar towing vehicle, said hoist comprising:

a frame work including a base adapted to be mounted on a vehicle bed and laterally spaced upstanding frame members mounted to the base and projecting upwardly therefrom;

a Z-shaped support structure including: a generally vertical standard; a generally horizontal upper leg having a front end hinged to said frame members by an upper, front transverse, horizontal-axis hinge member, and a rear end secured to said generally vertical standard, which is adapted to be disposed adjacent but to the rear of the vehicle bed on which the framework is mounted in use, at an upper site on said standard; and a lower leg having a front end mounted to said standard at a lower site which is arranged to be located, in use, adjacent but above a ground surface on which the towing vehicle may run, said upper site being disposed to be located, in use, above said vehicle bed, and said lower site being disposed to be located, in use, below said vehicle bed; said lower leg being joined at said front end thereof to said standard at said lower site by a lower, rear transverse, horizontal-axis hinge member; and said lower leg being provided at a rear end thereof with left and right, upwardly arcuate cradle means disposed for supporting left and right wheels of an end of a vehicle which is to be towed; and

means for separately power-articulating said upper, front and lower, rear hinge means respectively for raising and lowering said standard and for moving said cradles between a lowered position of use, in which said lower leg is approximately horizontal and projects rearwardly, and a stowed position, in which said lower leg is approximately vertical and projects upwardly from said lower site on said standard;

said upper, front transverse, horizontal-axis hinge member comprising a pipe hinge made of coaxial inner and outer steel pipes restrained against axial movement, the inner pipe thereof being secured to said frame members, and the outer pipe thereof having the front end of said upper leg secured thereof;

said upper leg comprising a pair of laterally spaced adjacent beams each separately secured to said outer pipe of said front transverse, horizontal-axis hinge member and to said standard;

said lower, rear transverse, horizontal-axis hinge member comprising a pipe hinge made of coaxial inner and outer steel pipes restrained against axial movement, one of the pipes thereof being secured to said standard and the other of the pipes thereof being secured to said lower leg.

4,840,535

VERTICAL SUBMERSIBLE PUMP ASSEMBLY

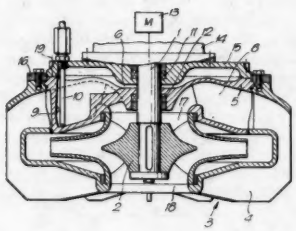
Torgeir Skarstad, Spikkestad, Norway, assignor to Kvaerner-Eureka A/S, Tranby, Norway

Filed Jan. 20, 1988, Ser. No. 146,129

Claims priority, application Norway, Oct. 26, 1987, 874457

Int. Cl.[4] F01D *25/32*

U.S. Cl. 415—168.2 2 Claims

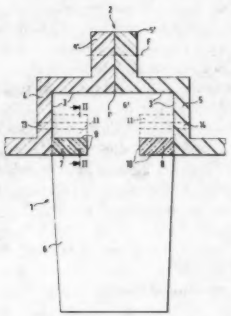


1. A vertical submersible pump assembly, comprising a centrifugal pump assembly with a rotor, and a pump casing, and a drive motor connected with pump rotor by a drive shaft, with a drain chamber surrounding the drive shaft and being sealed off in the direction of the pump rotor, and the drive motor with respective shaft seal means, wherein the centrifugal pump has upper and lower inlets, the pump casing forms the bottom of the drain chamber and contains the seal means against the pump rotor, and the drain chamber is shaped as a downwardly closed pocket extending down into the upper pump inlet, and means extending down into said pocket to remove liquid from said pocket.

4,840,536
AXIAL GUIDE BLADE ASSEMBLY FOR A COMPRESSOR STATOR

Siegfried Sikorski, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,233
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711764
Int. Cl.[4] F01D 9/04
U.S. Cl. 415—190 11 Claims



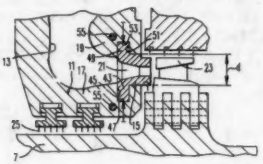
1. An axial guide blade assembly, especially for a compressor stator, comprising compressor housing means having a longitudinal housing axis, said housing means including housing sections divided in a plane (P) extending perpendicularly to said longitudinal housing axis, said housing sections forming an inner circumferential groove in said housing means, a plurality of guide blades each having a longitudinal blade axis extending substantially radially to said longitudinal housing axis, each of said guide blades having a root an a guide section, two fiber rings for mounting said guide blades in said inner circumferential groove, each guide blade having two recesses in and near its root, one of said recesses being arranged at a front edge of said guide blade near said root and the other of said recesses being arranged at a rear edge of each guide blade near said root, thereby forming a front edge group of recesses and a rear edge group of recesses, each group of recesses receiving one of said fiber rings, each of said fiber rings (7, 8) having a plurality of locating gaps (11), one guide blade being received in each locating gap, so that each of said guide blades is suspended by said rings in said recesses, wherein said fiber rings having a radially directed thermal expansion coefficient, relative to said longitudinal housing axis, which expansion coefficient is greater than a corresponding thermal expansion coefficient of said compressor housing means, whereby said guide blades and said fiber rings are clamped together in said inner circumferential groove of said housing means due to said different thermal expansion coefficients.

4,840,537
AXIAL FLOW STEAM TURBINE

George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1988, Ser. No. 257,909
Int. Cl.[4] F01D 1/02
U.S. Cl. 415—202 9 Claims

1. An axial flow steam turbine comprising:
a rotor;
a casing;
an inlet nozzle ring disposed circumferentially about said rotor within said casing, said inlet nozzle ring including radially spaced inner and outer sections, said sections having confronting channels across said space, and a plurality of nozzle chambers communicating with said space; and
a plurality of nozzle blocks having radially inwardly and

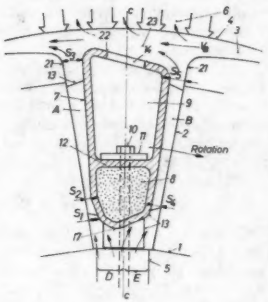


outwardly extending flanges, said flanges positioned in said confronting channels of said inlet nozzle ring and contained therein under compressive forces exerted by said nozzle ring sections.

4,840,538
INTERPOLAR BODY FOR COOLING SALIENT-TYPE ROTOR BY VENTILATION

Kalman N. Lehoczky, 5228 18th Ave. East, Bradenton, Fla. 34208

Filed Aug. 18, 1987, Ser. No. 86,501
Int. Cl.[4] F01D 5/18
U.S. Cl. 416—96 A 11 Claims



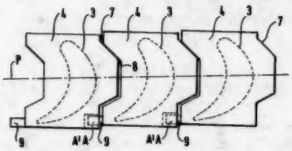
1. A device for cooling salient-type rotor poles of an electrical machine, comprising:
a rim which serves as a yoke of the rotor and which has radially extending ventilation ducts for carrying cooling air therethrough;
a plurality of spaced salient poles being mounted on the perphery of rim such that interpolar spaces are defined between adjacent ones,
and creating a radial airgap between the salient poles and the internal surface of the stator;
a plurality of interpolar bodies placed in the interpolar spaces providing radially extending ventilation gaps on both sides of the interpolar body and relative to the adjacent salient poles, and
the interpolar bodies having a circumferentially extending top surface close to the internal surface of the stator creating a circumferential channel between the interpolar body and the internal surface of stator, and the top surface providing openings between the interpolar body and the tip of salient poles and corresponding to the radially extending ventilation gaps wherein internal parallel to the rotational axis, wherein at least some of the internal channels extending parallel to the rotational axis are filled with materials different from those constituent in the outer wall of the interpolar bodies.

4,840,539

MOVING BLADING FOR STEAM TURBINES

Pierre Bourcier, and Gilbert Riollet, both of Paris, France, assignors to Alsthom, Paris, France

Filed Mar. 8, 1988, Ser. No. 165,320
Claims priority, application France, Mar. 12, 1987, 87 03390
Int. Cl.[4] F01D 5/22
U.S. Cl. 416—191 12 Claims



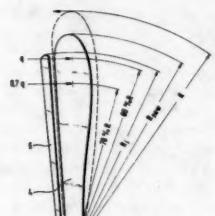
1. Moving blading for a steam turbine, the blading comprising a plurality of blades having respective generally radial bodies provided with transverse members with the transverse members on adjacent blades in contact, at least during rotation of the blading over plane surfaces which are substantially parallel to radial axes Z'Z of the blades, said contact causing the blade bodies to twist, the improvement wherein, in addition to said contact between adjacent transverse members, said blading includes links provided by means of additional contacts which are free to slide rectilinearly in planes corresponding to the plane of each transverse member along respective axes which are substantially perpendicular to the axis of rotation 00' of the blading, said additional contacts being situated at a relatively large distance from said contact that gives rise to twisting.

4,840,540

PROPELLER WHOSE BLADES ARE PROVIDED WITH SLATS

Michael Kallergis, Brunswick, Fed. Rep. of Germany, assignor to Deutsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 210,115
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721295
Int. Cl.[4] B64C 11/16
U.S. Cl. 416—223 A 2 Claims



1. Propeller, each of whose blades is provided with a slat which is rigidly connected to the propeller blade, and of which the outer radius is smaller than the blade radius, wherein the slat tips lie on a diameter given by the equation

$$D_i = \sqrt{[(LTLP)^2 \cdot a_0^2 - v_\infty^2]} \,/\pi \cdot n$$

where

LTLP = lower transonic limit of the particular blade configuration including slat

a_0 = velocity of sound in air

v_∞ = flight speed

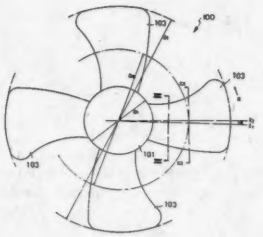
n = propeller rotational speed.

4,840,541

FAN APPARATUS

Takaaki Sakane, Nagoya, and Kazuhiro Takeuchi, Chita, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 11, 1988, Ser. No. 167,309
Claims priority, application Japan, Mar. 13, 1987, 62-59194; Feb. 24, 1988, 63-41435
Int. Cl.[4] F04D 29/38
U.S. Cl. 416—223 R 5 Claims



1. A fan apparatus having a boss portion which is driven to be rotated and a plurality of blades connected to said boss portion in such a manner that said boss portion positions at a center position of said a plurality of blades, wherein;

a setting angle of said blade at a first area from a bottom portion of said blade to an inter mediate portion is maintained substantially the same,

the setting angle of the said blade at a second area from said intermediate portion to a top portion of said blade is gradually increased,

a chord length of said blades is gradually increased from the bottom portion to the top portion of said blade,

a first wing axis which represents a center portion of the chord length at the first area from the bottom portion to the intermediate portion of the blade is inclined to a second wing axis which represents the center portion of the chord length at the second area from the intermediate portion to the top portion in such a manner that the second wing axis inclined toward a rotating direction of said boss from the first wing axis; and

a profile of said blade is so formed that the profile at the first area is perpendicular to the first wing axis and the profile at the second area is perpendicular to the second wing axis.

4,840,542

INFUSION PUMP WITH DIRECT PRESSURE SENSING

Martyn S. Abbott, Richardson, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 717,131, Mar. 27, 1985, Pat. No. 4,657,490. This application Apr. 10, 1987, Ser. No. 37,019
Int. Cl.[4] F04B 43/08; A61M 1/00
U.S. Cl. 417—9 2 Claims

1. A pump for parenteral administration of fluid to a patient from an elevated I.V. container comprising:

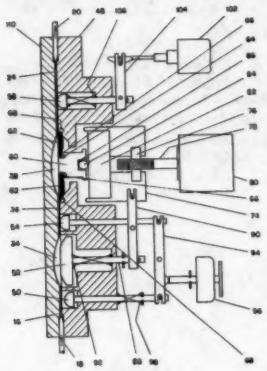
tubing extending from the I.V. container to the patient;

a disposable pump chamber in line with the tubing;

a pump including means operating in discrete cycles for pressurizing the pump chamber and means for measuring the pressure during pumping cycles;

an outlet valve downstream from the pumping chamber;

means for measuring the gravity head pressure at the pump when the outlet valve is closed prior to the beginning of a pumping cycle, and establishing an operational occlusion pressure based on the measured head; and



means for stopping the pump if the measured pumping pressure exceeds the occlusion pressure during a pumping cycle.

4,840,543

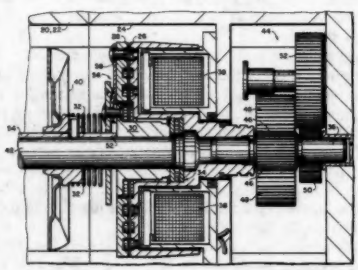
CLUTCH APPARATUS FOR RAPID POWER SOURCE CONVERSION

John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446

Filed Aug. 10, 1988, Ser. No. 230,594

Int. Cl.[4] F04B *17/00*; F16D *27/06*

U.S. Cl. 417—223 **11 Claims**



1. Apparatus for use in combination with a motor driven mechanism, such as an airless spray paint pump, which permits the power source thereof to be converted between an electric motor and an internal combustion engine, wherein the respective output shafts of said electric motor and internal combustion engine are identical and when mounted to said motor driven mechanism are aligned with the input shaft thereof so as to directly drive the input shaft of the motor driven mechanism, said apparatus comprising:

(a) a driven clutch plate fixedly connected to the input shaft of said motor driven mechanism;

(b) a drive clutch plate;

(c) a clutch hub axially displaceable and non-rotatably mounted on the output shaft of the electric motor or internal combustion engine;

(d) means for mounting said driven clutch plate to said clutch hub so that said driven clutch plate is normally biased to a fixed axial position on said clutch hub and axially resiliently moveable relative to said clutch hub toward said driven clutch plate;

(e) biasing means axially biasing said clutch hub on said output shaft toward the input shaft;

(f) a thrust bearing arranged so as to permit a slight clearance between the faces of said drive and driven clutch plates when said clutch hub is biased toward the input shaft; and

(g) activation means for causing said driven clutch plate to move axially relative to said clutch hub to close the clearance between said drive and driven clutch plates and non-rotatably engage said driven clutch plate.

4,840,544

HYDRAULIC PUMP ASSEMBLY ASSOCIATED WITH ACCUMULATOR

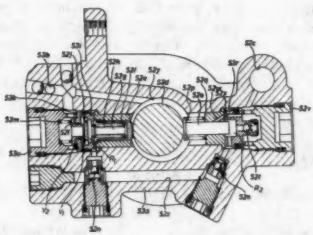
Hiromu Kuromitsu, Kariya; Nobuyasu Nakanishi, Toyota; Akira Shirai, Toyota, and Noboru Noguchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 826,617, Feb. 6, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 214,830

Claims priority, application Japan, Feb. 6, 1985, 60-15426; Mar. 26, 1985, 60-44663; Mar. 26, 1985, 60-44664; Mar. 26, 1985, 60-44665

Int. Cl.[4] F04B *1/02*

U.S. Cl. 417—254 **6 Claims**



1. A hydraulic pump assembly for us in combination with an accumulator for supplying hydraulic fluid under pressure into the accumulator through an inlet check valve associated thereto, comprising:

a pump housing provided with an inlet port for connection to a fluid reservoir and an outlet port for connection to said accumulator through said inlet check valve;

a single cam shaft rotatably mounted within said pump housing to be driven by a power source;

a first pump assembly of large displacement capacity including a first cylinder provided within said pump housing perpendicularly to said cam shaft, a first plunger axially movably disposed within said first cylinder for reciprocation by engagement with said cam shaft, a first suction check valve arranged to cooperate with said first plunger for permitting therethrough flow of hydraulic fluid from said inlet port toward said first plunger, a relief valve associated with said first suction check valve to release excessive hydraulic pressure from a pump chamber between said first suction check valve and said first plunger into a chamber in communication with said inlet port, and a first exhaust check valve arranged to cooperate with said first plunger for discharging therethrough the hydraulic fluid pressurized by said first plunger; and

a second plunger pump assembly of small displacement capacity including a second cylinder provided within said pump housing perpendicularly to said cam shaft, a second plunger axially slidably disposed within said second cylinder for reciprocation by engagement with said cam shaft, a second suction check valve arranged in communication with said first exhaust check valve to cooperate with said

second plunger for permitting therethrough the flow of pressurized hydraulic fluid from said first exhaust check valve toward said second plunger, and a second exhaust check valve arranged to cooperate with said second plunger for discharging therethrough the hydraulic fluid pressurized by said second plunger toward said outlet port;

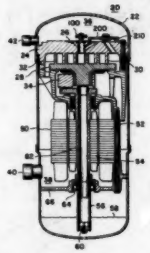
wherein said first suction check valve comprises a cylindrical retainer fixedly coupled with said first cylinder, an axially movable valve plate disposed within said cylindrical retainer movable in response to reciprocation of said first plunger, an annular valve seat fixedly coupled with said cylindrical retainer, a cylindrical valve body axially slidably coupled with said annular valve seat, and resilient means for biasing said valve body toward said valve plate, said cylindrical valve body having an annular seat portion cooperable with a flat surface of said valve plate, wherein said relief valve comprises an annular flange of said valve body cooperable with said valve seat, and wherein the flat surface of said valve plate is adapted to be brought into engagement with the annular seat portion of said valve body only by the hydraulic fluid pressurized by said first plunger.

4,840,545

SCROLL COMPRESSOR RELIEF VALVE

John R. Moilanen, La Crescent, Minn., assignor to American Standard Inc., New York, N.Y.

Filed May 16, 1988, Ser. No. 194,271
Int. Cl.[4] F04B *49/02*
U.S. Cl. 417—301 **20 Claims**



1. A scroll compressor reverse-rotation relief valve for a hermetic compressor operating to compress a refrigerant, said relief valve comprised of:

a scroll compressor element disposed in said hermetic compressor to divide said scroll compressor into a suction pressure portion and a discharge pressure portion, said scroll compressor element having a discharge port defined therethrough to discharge refrigerant into said discharge pressure portion, said scroll compressor element further including a relief passage interconnecting a source of suction pressure refrigerant to said discharge port;

means for preventing a backflow of refrigerant from said discharge pressure portion into said discharge port;

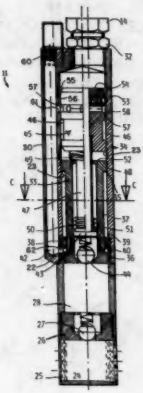
means for closing said relief passage in a flow preventing manner disposed in said relief passage, said relief passage closing means being refrigerant pressure responsive to selelctively prevent a flow of refrigerant through said refief passage whereby said relief passage is closed by said relief passage closing means when the scroll compressor is operated with the correct rotation to produce refrigerant discharge pressure exceeding refrigerant suction pressure, and said relief passage is open to permit passage of suction pressure refrigerant to said discharge port when the scroll compressor is operated in reverse rotation to produce refrigerant discharge pressure less than refrigerant suction pressure.

4,840,546

PUMP FOR LIQUIDS AND GASES

Ludvig Nass, Liljeveien 4b, S-7400 Oppdal, Norway

Continuation of Ser. No. 542,172, Oct. 14, 1983, abandoned. This application Mar. 6, 1986, Ser. No. 838,396
Int. Cl.[4] F04B *47/08*
U.S. Cl. 417—403 **6 Claims**



1. A pump immersible in a well hole or the like for pumping liquids and gases therefrom using a supply of pressurized working medium, the pump comprising

an elongated pump housing having an inner wall formed to define a longitudinal bore,

a partition mounted on the inner wall to divide the housing bore into an upper housing chamber and a lower housing chamber, the partition formed to include an aperture for the reception of a piston, the inner wall of the upper housing chamber being formed to include first, second, and third ports,

a double acting piston in the bore, the double acting piston including an upper flange, a lower flange, and a hollow shaft extending therebetween, the hollow shaft being mounted for sliding movement in the partition aperture to position the upper flange in the upper housing chamber and to position the lower flange in the lower housing chamber,

the hollow shaft, the partition, and the inner wall of the pump housing cooperating with the upper flange to define an upper working chamber for the reception of pressurized working medium and with the lower flange to define a lower working chamber for the reception of pressurized working medium,

first conduit means for conducting pressurized working medium to the first port of the upper housing chamber,

second conduit means for conducting pressurized working medium between the second port of the upper housing chamber and the upper working chamber,

third conduit means for conducting pressurized working medium between the third port of the upper housing chamber and the lower working chamber, and

control valve means for controlling the direction of movement of the double acting piston within the housing bore, the control valve means being mounted for sliding movement in the upper housing chamber between a lower and an upper operating position, the control valve means including first means for interconnecting the first and second conduit means to deliver pressurized working medium from the supply of pressurized working medium to the upper working chamber when the control valve means is in its lower position to move the double acting piston in an upward direction within the housing bore and

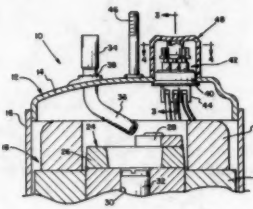
second means for interconnecting the first and third conduit means to deliver pressurized working medium from the supply of pressurized working medium to the lower working chamber when the control valve means is in its upper position to move the double acting piston in a downward direction within the housing bore.

4,840,547

COMPRESSOR INCLUDING PROTECTIVE CAP FOR HERMETIC TERMINAL

Emanuel D. Fry, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 10, 1988, Ser. No. 230,578
Int. Cl.[4] F04B *35/04*; H01R *13/44*
U.S. Cl. 417—422 **20 Claims**



8. In combination with a hermetic compressor having a sealed housing and a hermetic terminal including a base portion and at least three circularly arranged conductor pins extending upwardly, parallel to one another, from the base portion on the exterior of the housing, a protective cap on said hermetic terminal for temporarily covering the hermetic terminal when it is not otherwise connected to an external source of power, such as during manufacturing, shipping, and storage of the compressor, said protective cap comprising:

a cup-shaped body member, including an open end, a closed end, and a generally cylindrical sidewall therebetween, said open end being disposed circumjacent the hermetic terminal base portion; and

a generally cylindrical stud portion having an attached end and an opposite unattached end, said attached end being attached to said body member closed end, said stud portion being disposed substantially coaxially within said body member in spaced relationship with said sidewall, said unattached end being disposed radially inwardly of the circularly arranged conductor pins in contacting engagement therewith.

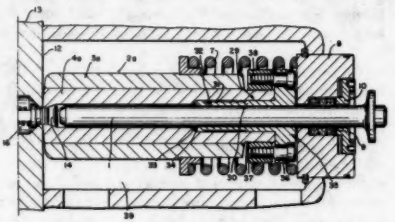
4,840,548

HIGH PRESSURE PLUNGER PUMP

Paul Hammelmann, Zum Sundern 17, 4740 Oelde, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,153
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709611
Int. Cl.[4] F04B *19/02, 21/02*
U.S. Cl. 417—469 **7 Claims**

1. A high pressure plunger pump, comprising a centrally arranged pressure valve; an oscillatingly movable plunger having an axis; a sleeve guided on said plunger and limiting a working chamber; a suction chamber which surrounds said sleeve and accommodates an aspirated fluid, said sleeve having a ring chamber which opens toward said plunger; and a bush which is arranged in said ring chamber and supported against said plunger, said bush abutting against the plunger, said bush being formed as a one-piece sealing bush composed of metal, said bush being provided with an opening extending towards said plunger and limiting with said sleeve an additional ring chamber which is filled with a leakage fluid and loaded with a pressure which acts in the region of said opening, said first-mentioned ring chamber having a front end and a front end surface; and further comprising a ring-shaped soft packing



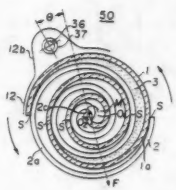
arranged at said front end of said first-mentioned ring chamber, said soft packing overlapping said front end surface and extending axially at both sides of said front end surface.

4,840,549

SCROLL COMPRESSOR WITH CONTROL OF DISTANCE BETWEEN DRIVING AND DRIVEN SCROLL AXES

Etsuo Morishita; Masayuki Kakuda, both of Amagasaki; Masahiro Sugihara, Wakayama; Tsutomu Inaba, Wakayama; Toshiyuki Nakamura, Wakayama, and Tadashi Kimura, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 12,375, Feb. 9, 1987, Pat. No. 4,753,582. This application Jun. 9, 1988, Ser. No. 204,253
Claims priority, application Japan, Feb. 12, 1986, 61-28427
Int. Cl.[4] F04C *18/04, 27/00*
U.S. Cl. 418—55 **2 Claims**



1. A scroll compressor which comprises:

a sealing container,

a driving scroll with a wrap plate,

a driven scroll with a wrap plate, which is combined with said driving scroll to form a compression chamber therebetween,

an Oldham's coupling for transmitting a driving force of said driving scroll to said driven scroll,

a partition plate fixed to said container and having a supporting pin provided at a position near the inner wall of said container,

a movable bearing support which supports said driven scroll, said movable bearing support being placed below said partition plate and having a bearing engaged with said supporting pin, the engagement between said supporting pin and said bearing comprising means for supporting said movable bearing support for swingable motion around said supporting pin, and

a rotation controlling means which causes a swinging movement of said movable bearing support around said supporting pin along with said driven scroll whereby the distance between the axial centers of said driving and driven scrolls is changed, wherein said rotation controlling means has a center around which said movable bearing support is swung, the center of the controlling means

being determined in such a position that it is opposite a vector of the compressing force acting on said driven scroll and at an angle deviated from the imaginary line on the vector in the direction of rotation of said driven scroll.

4,840,550

INTERNAL AXIS ROTARY PISTON ENGINE WITH PROTRUSIONS HAVING TWO SEALING CORNERS

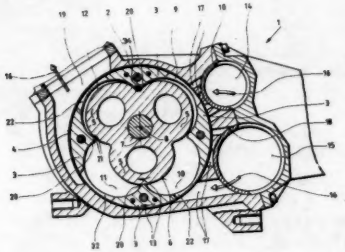
Hans Baumgartner, Viersen; Manfred Brandstädter, Düsseldorf, and Ulrich Henke, Übach Palenberg, all of Fed. Rep. of Germany, assignors to Pierburg GmbH, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 145,836

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702558

Int. Cl.[4] F01C *1/10, 19/00*

U.S. Cl. 418—150 **7 Claims**



1. A rotary piston engine, comprising:

a housing;

an outer rotor and an inner rotor provided so as to rotate around different axes of rotation, the outer rotor having engagement parts defining working spaces therebetween and the inner rotor having pistons; and

strip-like protrusions having two sealing corners provided so as to extend in a spaced manner next to each other in the rotational direction of the outer rotor, said protrusions being provided at the engagement parts of the outer rotor so as to project radially inward and form a contour of the pistons of the inner rotor, the working spaces each having a volume exclusively sealed by sealing edges formed by the sealing corners so as to extend across the entire length of the inner rotor, these sealing corners being arranged so that only sealing corners of two adjacent engagements parts of the outer rotor contact a piston of the inner rotor as the piston enters a working space of the outer rotor.

4,840,551

ARRANGEMENT FOR REPAIRING STONE IMPACT DAMAGES AT WINDSHIELDS MADE OF MULTI-LAYER SAFETY GLASS

Kurt Lay, Rottenburg, and Erwin Sailer, Altdorf, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

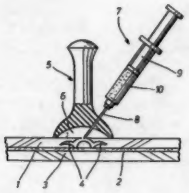
Filed Mar. 6, 1987, Ser. No. 23,000

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607738

Int. Cl.[4] B29B *9/00*

U.S. Cl. 425—12 **4 Claims**

1. An arrangement for repairing stone impact damages at windshields, comprising a transparent plastic cup means adapted to be sealingly placed on the windshield over the damage, and having flexible resilient material means for causing a vacuum-tight intermediate space between the plastic cup means and the windshield, substantially the entire plastic cup means consisting of said flexible material means which is able to be pierced anywhere throughout its entirety by means of a hollow needle means, and wherein said flexible material means forms a vacuum-tight sealed passage, a hollow needle extending through the sealed passage into said intermediate space while allowing said hollow needle means to be freely moved in



said vacuum-tight intermediate space by virtue of the vacuum-tight sealed passage in said flexible material.

4,840,552

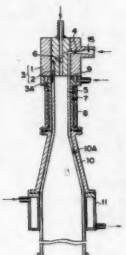
APPARATUS FOR CONTINUOUSLY PRODUCING HEAT-SHRINKABLE CROSSLINKED RESIN TUBE

Akihumi Onishi; Masakasu Hasegawa; Michio Takaoka; Tsuneaki Motai; Motoyuki Ono, and Shotaro Yoshida, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,784

Int. Cl.[4] B29C *47/88*

U.S. Cl. 425—72.1 **11 Claims**



1. An apparatus for continuously producing a heat-shrinkable crosslinked resin tube, comprising

an extruder head including a die and a mandrel combined therewith for extruding a crosslinkable resin composition into a hollow tube,

means associated with said extruder head for introducing a fluid under pressure into the interior of the tube being extruded by said extruder head,

a crosslinking cylinder disposed downstream of said extruder head for causing the tubular resin composition to cross-link by continuously heating said tube,

an unheated expanding die disposed immediately downstream of said crosslinking cylinder for conducting the tube therethrough without further application of heat and having an interior surface having a continuously increasing diameter in a downstream direction,

a cooling cylinder disposed immediately downstream of said expanding die for cooling the tube,

guide means disposed downstream of said cooling cylinder for deforming the tube into a flattened form, and

means disposed downstream of said guide means for drawing the tube away from said extruder head,

wherein a smooth non-perforated interior surface free of a

substantial gap or step extends continuously from said crosslinking cylinder to said cooling cylinder.

4,840,553

METAL MOLD STRUCTURE FOR MOLDING MULTI-LAYER RESIN

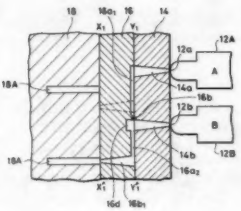
Takashi Arai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 24,711, Mar. 11, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 246,613

Claims priority, application Japan, Mar. 20, 1986, 61-063453; Mar. 27, 1986, 61-069424; Jun. 26, 1986, 61-098586

Int. Cl.[4] B29C *45/13, 45/16*

U.S. Cl. 425—129.1 **2 Claims**



1. A metal mold for a multi-layer resin molded article for effecting, in injection-molding a cylindrically-shaped part, sandwich molding in which core layer resin is used for the center of the cylinder portion of the cylindrically-shaped part and skin layer resin is used for the portion around said center of the cylinder portion, characterized in that a mold member provided with a cavity for molding said cylindrically-shaped part has attached thereto a runner plate provided with a plurality of runners for passing said resins therethrough into said cavity, said runner plate has attached thereto a fixed plate provided with a sprue connected to an injection cylinder unit for the core layer resin and an injection cylinder unit for the skin layer resin, the start point of said plurality of runners and the injection port of said injection cylinder unit for the core layer resin are arranged on a straight line, a resin reservoir is provided at a position on said straight line, a runner for the skin layer resin is provided between said injection cylinder unit for the skin layer resin and said start point of said runners, and a gate having a reduced resin flow-cross-section is provided at a location in said runner for the skin layer resin near said resin reservoir.

4,840,554

EXTRUSION HEAD EQUIPPED WITH A CLAMPING DEVICE FOR THE TOOL COMPONENTS

Ingo Hirschkorn, Neu Wulmstorf, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 179,941

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712343.2

Int. Cl.[4] B29C *47/00*

U.S. Cl. 425—190 **11 Claims**

1. In an extrusion tool including

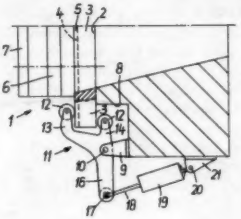
an end plate,

a plate holder cassette including means for seating said end plate, and having opposite first and second faces;

an extrusion head including means for seating said cassette; said first face of said cassette being oriented towards said extrusion head and said second face of said cassette being oriented away from said extrusion head;

first clamping means having an operative position for pressing said cassette and said end plate as a unit against said extrusion head by engaging an outer face of said end plate; said first clamping means having a withdrawn position in which said first clamping means permits a removal of said end plate from said cassette and a removal of said cassette from said extrusion head;

the improvement comprising a second clamping means for pressing, in a clamping position thereof, said cassette



against said extrusion head by engaging said second face of said cassette externally of said end plate, whereby said end plate is, in said withdrawn position of said first clamping means, removable from said cassette while said cassette remains pressed against said extrusion head by said second clamping means.

4,840,555

INSTALLATION FOR THE SIMULTANEOUS THERMOFORMING OF AT LEAST ONE ROW OF CONTAINERS IN THERMOPLASTIC MATERIAL, EACH CONTAINER BEING PROVIDED WITH A DECORATIVE BANDEROLE

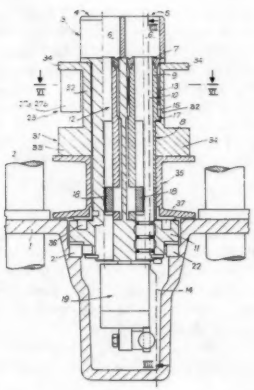
Jean-Claude Hautemont, Gif-sur-Yvette, France, assignor to Societe a Responsabilite Limitee, Les Ulis Cedex, France

Filed Dec. 9, 1988, Ser. No. 281,789

Claims priority, application France, Dec. 11, 1987, 87 17355

Int. Cl.[4] B29C *51/02*

U.S. Cl. 425—500 **18 Claims**



1. Installation for the simultaneous thermoforming of at least one row of containers in thermoplastic material, in which each one of the containers are provided with a decorative banderole, installation of the type comprising:

a thermoforming station through which is fed step-by-step a thermoforming band pre-heated to its forming temperature, and which comprises, under the path of said thermoplastic band, a molding unit equipped with a plurality of vertical cylindrical forming chambers disposed in at least one row transversal with respect to the horizontal step-by-

step feeding direction of the thermoplastic band, said chambers being open at their top part and having at their lower end, an opening adapted to be closed off by a bottom element movable with respect to the molding unit, so as to be capped by the corresponding molding unit which rests on a press table, vertically movable between a high or thermoforming position and a low or container-stripping position, and

a device for cutting, preforming and transferring the banderoles in the forming chambers of the molding unit, said device comprising, from upstream to downstream, in the moving direction of the banderoles:

a roller supporting a reel of master band, said roller being mounted on bearings on either side of the reel,

a cutting unit for longitudinally cutting the master-band into individual bands, said cutting unit being mounted on a supporting frame laterally spaced from the molding unit,

a pre-winding unit for pre-winding the decorative banderoles, said pre-winding unit presenting, inside a supporting unit which is placed under the molding unit:

(a) a plurality of vertical cylindrical pre-winding chambers, each one in alignment with one of the forming chambers so that the vertical wall of each pre-winding chamber defines a contour which is homothetic to that of the forming chamber, yet slightly smaller than the contour of the latter, thus constituting by its upper edge, an annular holding shoulder which also defines the bottom opening of the forming chamber,

(b) a shaping member having a rod which traverses the pre-winding chamber and forms with the vertical wall thereof a narrow annular pre-winding and guiding chamber, and of which the upper part, on the one hand, constitutes at least part of the bottom plate and has a cross-section of similar yet smaller shape than that of the vertical wall of the forming chamber, so that the distance between the vertical wall of said forming chamber and the peripheral face of the upper end of the shaping member is at least equal to the thickness of a banderole, and on the other hand, is adapted to penetrate into the forming chamber and to apply said banderole and keep it applied against the vertical side wall of said forming chamber,

(c) a plurality of vertical access slots, each slot being provided in a lateral wall defining part of the pre-winding chambers and issuing obliquely in one of said pre-winding chambers provided in said supporting unit, and

(d) a transfer member provided in the pre-winding and guiding annular chamber and fast with the lower part of the rod of the shaping member, said transfer member being adapted to support the banderole until the latter has been transferred to the forming chamber by a relative movement between said transfer member and said forming chamber, and

a banderole introduction and transverse cutting unit comprising:

(a) a plurality of knives, each one of which is adapted to cooperate with a counter-blade for transversely cutting the back end of the banderole introduced at least partly into the corresponding pre-winding chamber,

(b) a plurality of pairs of introduction rollers having axes parallel to the vertical introduction slots, each pair being placed upstream of a knife and of an introductin slot and adapted to drive the individual band gripped between its two rollers at a pace equal to the length of a banderole,

(c) control means for turning the introduction rollers and sequentially actuating the transverse cutting knives, and

(d) a supporting carriage, moveable horizontally parallel to the plane containing the axes of the chambers of one row of forming chambers, and perpendicular to the thermoplastic band feeding direction, at a right angle with the forming station, said carriage carrying the transverse cutting knives, the pairs of introduction rollers and their control means, wherein:

the molding unit rests on the press table via the supporting unit and is fixed thereon in normally unremovable fashion;

the movable carriage comprises two partial carriages placed one behind the other following the direction of a row of pre-winding chambers;

the first partial carriage rests, in operative position, entirely on at least one lower horizontal slide rail of the supporting unit and is removably fixed on the latter and presents a vertical wall which is equipped with slots giving access to the pre-winding chambers, defines a lateral part of said chambers, and comprises, upstream of each slot, one of the pairs of introduction rollers, and downstream of said slot, a transverse cutting knife which cooperates with an edge of said slot, and means for controlling said transverse cutting knives as well as a transmission mechansim cooperating with said pairs of introduction rollers;

the second partial carriage, on the one hand, is guided on the surface on which rests the thermoforming installation in parallel to the guide rail of the first partial carriage, and, is adapted to be coupled to one of the lateral ends of the first partial carriage, and, on the other hand, comprises a driving motor ensuring displacement of said second partial carriage with respect to the frame of the thermoforming installation, and rotation control means whose output is connected to the input of the transmission mechanism, and

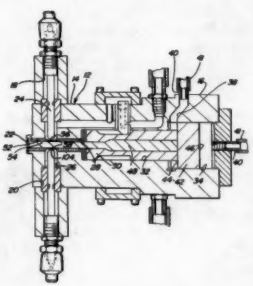
the supporting unit is removably mounted on the press table, is adapted to move on said press table in a horizontal direction parallel to the moving direction of the two partial carriages, and is equipped with means controlling the upward and downward movement of the shaping member.

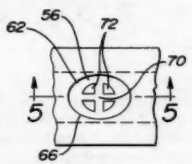
4,840,556

MIXING PLATE FOR INJECTION MOLDING MACHINE

Bernard J. Reilly, Troy, and Roger Michels, Utica, both of Mich., assignors to Extrusion Punch & Tool Co., Troy, Mich.

Filed Jul. 16, 1987, Ser. No. 74,066
Int. Cl.[4] B29C *45/02*
U.S. Cl. 425—543 **4 Claims**





1. An injection molding mixing head for producing a chemically reactive mixture of at least two fluid streams comprising:

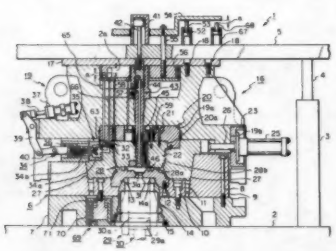
a body having a plurality of inlets and an outlet;
a first through bore formed in the body;
a hollow sleeve mounted within the first through bore and defining a mixing chamber therein, the mixing chamber being disposed in communication with the outlet of the body;
a plurality of orifices formed in the sleeve and communicating through the sleeve with the mixing chamber, each orifice comprising:
(a) a first portion disposed in fluid communication with the mixing chamber, the first portion being a cylindrical channel; and
(b) a second portion contiguously connected to the first portion, the second portion having continuously outwardly tapered side walls;
a plurality of reactant passageways, each passageway extending through the body and connecting an associated orifice and an associated inlet in fluid flow communication for the flow of the fluid stream into the mixing chamber;
a mixing plate positioned circumferentially across each orifice at the junction of the first and second portions thereof, each mixing plate having a plurality of apertures positioned thereon;
piston means reciprocally mounted within a fluid chamber formed within the body, the piston means having a pair of opposed faces;
a rod slidably disposed within the mixing chamber, the rod having the same cross-section as the mixing chamber, the rod having a first end and a second end, the first end attached to the piston means;
pressurized fluid inlet and outlet means formed within the body in fluid flow communication with the fluid chamber for sequentially admitting and exhausting pressurized fluid from opposed faces of the piston means to cause reciprocal movement of the piston means and rod attached thereto from a first position within the mixing chamber thereby opening the first and second orifices to the mixing chamber for fluid stream flow from the first and second passageways into the mixing chamber to a second position in which the piston rod closes off the first and second passageways from the mixing chamber to stop the flow of fluid streams into the mixing chamber and, concurrently, ejects the chemically reactive mixture of the first and second fluid streams in the mixing chamber through the outlet in the body.

4,840,557

VERTICAL INJECTION APPARATUS

Kenji Ishimoto, and Kouji Kawabata, both of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Nov. 25, 1987, Ser. No. 125,549
Claims priority, application Japan, Dec. 1, 1986, 61-284155; Jan. 8, 1987, 62-1055
Int. Cl.[4] B29C *45/34*
U.S. Cl. 425—555 **10 Claims**



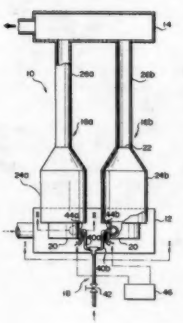
1. A vertical injection apparatus incorporated with a parting mold composed of mold elements comprising:
an upper mold half and a lower mold half having an outer side;
a mold pin having a lower free end portion and having an outer side, said mold pin being vertically movable between an upper position and a lower position, said mold pin at said upper position defining with said upper mold half and said lower mold half an initial cavity for receiving an injected melt, said mold pin at said lower position defining with said upper mold half and said lower mold half a final cavity forming a contour of a molded product;
a vertical sleeve hole at the outer side of said lower mold half;
a vertical melt passage hole communicating between the initial cavity and the sleeve hole, at least an upper part of the melt passage hole adjacent the initial cavity having a diameter smaller than a diameter of the sleeve hole but larger than a diameter of said mold pin for forming circumferential gap between said mold pin at the lower position thereof and the melt passage hole;
a vertically extending pin hole in said upper mold half coaxial with the melt passage hole and open to the initial cavity, said mold pin being provided to vertically move through the pin hole;
an injection sleeve having a plunger slidable therein for injecting melt into said initial cavity;
means for actuating the injection sleeve to cause the injection sleeve to move toward and be received in the sleeve hole;
means for actuating the plunger to cause the plunger to carry out an injection; and
means for actuating a movement of said mold pin between the upper and lower positions wherein after the melt in the sleeve is injected by the plunger into the initial cavity through the melt passage hole, said mold pin is forced to move from the upper position to the lower position so that a lower free end portion of said mold pin is inserted into at least the upper part of the melt passage hole through the initial cavity, thus urging the melt supplied in both the initial cavity and the melt passage hole against the surface of the initial cavity, and changing the melt in the initial cavity into the molded product in the final cavity.

4,840,558

PULSATING COMBUSTION SYSTEM

Kazuo Saito, Fujisawa; Toshihiko Saito, and Ken Kishimoto, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 24, 1987, Ser. No. 137,666
Claims priority, application Japan, Jun. 26, 1987, 62-159041
Int. Cl.[4] F23C *11/04*
U.S. Cl. 431—1 **4 Claims**



1. A pulsating combustion system comprising:
at least two combustion chambers, each having a circumfer-

ential wall and an exhaust port and said chambers each having the same arrangement;
air intake ports respectively formed in and terminating at said circumferential walls of said combustion chambers;
tail pipes connected to said exhaust ports in said combustion chambers;
air intake pipe means, one end of each of which is connected to a corresponding one of said air intake ports, for supplying air required for combustion into said combustion chambers at said circumferential wall in a way such that a turbulent flow is caused along the inner surfaces thereof;
a common air intake chamber to which the other ends of each of said air intake pipe means are commonly connected;
an exhaust chamber to which said tail pipes are commonly connected;
valve means, one of which is arranged in each said air intake pipe means, for aerodynamically maintaining a forward flow coefficient higher than a reverse flow coefficient;
means for injecting fuel into each of said air intake pipe means at a location between said valve means and each of said air intake ports;
ignitors respectively arranged in said combustion chambers;
an air supply fan arranged in said common air intake chamber; and
means for starting said air supply fan and said ignitors at an operation start time.

4,840,559

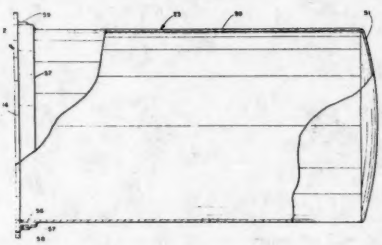
SEAL ARRANGEMENT FOR HIGH TEMPERATURE FURNACE APPLICATIONS

Klaus H. Hemsath, Toledo, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 130,098, Dec. 2, 1987, Pat. No. 4,787,844. This application Sep. 14, 1988, Ser. No. 244,307

Int. Cl.[4] F27D *1/16*

U.S. Cl. 432—3 **4 Claims**



1. A method for maintaining a door in sealing engagement with a heat treat furnace having an imperforate, cylindrical shell member into which work is placed, said shell member having a flanged opening sealed by an elastomer element between said flange and said door, said method comprising the steps of:
(a) insulating the exterior wall of said shell member by providing yielding insulation extending axially along said shell member from said flange for a predetermined distance;
(b) insulating the interior wall of said shell member from radiant heat by providing an insulation barrier spaced a radial distance away from the interior wall of said shell member and generally adjacent said outside insulation;
(c) heating said shell member about its outside surface up to said insulation whereby the diameter of said shell thermally expand;
(d) cooling the shell by a coolant within a water jacket adjacent the flange whereby the shell wall adjacent said insulation is cooled principally by conduction in a progressive manner from a hot temperature at a position on said shell member adjacent the end of said yieldable insulation furthestremoved from said flanged end to a low temperature adjacent said flanged end to avoid thermal destruction of said elastomer seal.

4,840,560

HEATING STOCK IN A HEATING CHAMBER

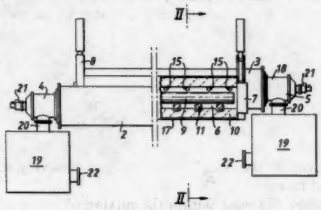
John D. Waddington, Solihull, United Kingdom, assignor to British Gas PLC, London, England

Filed Nov. 25, 1987, Ser. No. 125,333

Claims priority, application United Kingdom, Jan. 3, 1987, 8700219

Int. Cl.[4] F27B *9/28*

U.S. Cl. 432—59 **1 Claim**



1. Apparatus for heating stock comprising a heating chamber for receiving stock for heating with a heating gas, a first elongated plenum chamber extending along one side of said heating chamber and having an opening at one end thereof, a second elongated plenum chamber extending adjacent the opposite side of said heating chamber and having an opening at one end thereof, a first plurality of ports communicating said first plenum with said heating chamber, a second plurality of ports communicating said second plenum with said heating chamber, a fist regenerative type burner communicating with the opening at the end of said first plenum, a second regenerative type burner communicating with the opening at the end of said second plenum, each burner being adapted on its firing cycle to supply heating gas to its plenum chamber in a direction parallel to the side of the heating chamber for subsequent distribution to the heating chamber for heating the stock and on its flueing cycle to receive from its plenum chamber waste gas discharged from the heating chamber, the arrangement being that, in use, while one burner is firing the other is flueing.

4,840,561

APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL

Georg Unland, Ennigerloh, and Günter Driemeier, Lienen, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,384

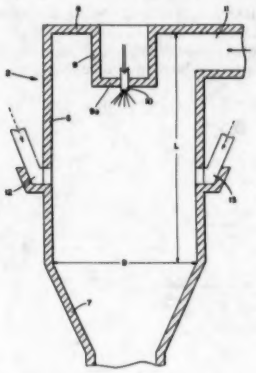
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701964

Int. Cl.[4] F27B *7/02*

U.S. Cl. 432—106 **10 Claims**

1. In apparatus for heat treating fine-grained material, such as cement raw material, including
(a) a multi-stage preheater for preheating the material,
(b) an upright combustion chamber in communication with said preheater for precalcining the preheated material,
(c) a rotary drum furnace for receiving and burning the precalcined material and having an exhaust pipe in communication with the preheater, and
(d) a cooler in communication with said furnace for receiving and cooling the burnt material,
(e) said combustion chamber being cylindrical at its upper region and forming a hopper at its lower region; said combustion chamber having at its upper region a cover, a

fuel supply, and a tangential inlet communicating with a conduit for receiving combustion air from said cooler; said combustion chamber having at least one material supply for receiving preheated material from said preheater; said lower region of said combustion chamber having an open-



ing therein for the delivery of precalcined material and gases of combustion to said exhaust pipe,

the improvement wherein:

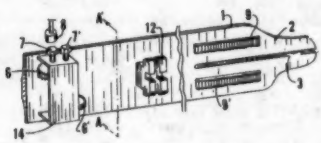
(f) said cover has a downwardly extending recess therein at the level of the combustion air inlet, said recess having a base on which said fuel supply is mounted.

4,840,562

ADJUSTABLE ORTHODONTIC BAND

Mark Wilson, 30131 Town Center Dr. #160, Laguna Niguel, Calif. 92677, and Joseph Burrell, 22504 Warmside Ave., Torrance, Calif. 90505

Filed Nov. 13, 1987, Ser. No. 120,129
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—23 **2 Claims**



1. An adjustable orthodontic band comprising:

a. a flat, soft-metal strip which is relatively thick in the center and thinning towards its edges and narrowing at one end to form a tang, said tang being split along its length into two joined halves;

b. a pair of horizontal, gear-cut racks, one attached on the upper half and one on the lower half of the tang, the attachment being made by a suitable process such as welding;

c. a frame attached to the other end of the strip;

d. a pair of pinion-bearing shafts mounted to and vertically rotatable in said frame, the pinions being of a size to mesh with the gear-cut racks and capable of creating upper and lower tightening and stretching forces in the flat, soft-metal strip;

e. locking means cooperating between the pinion-bearing shafts and said frame to inhibit rotation of the shafts when desired;

f. a slotted bracket attached to the strip in the area between the frame and the gear-cut racks, said bracket being capable of holding archwires in an orthodontic process;

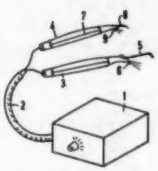
whereby the flat, soft-metal strip is first formed into a cylindrical shape by introducing the tang into said frame so that each pinion is engaged with its corresponding rack, the cylinder thus formed then being placed over a tooth to be banded, the two pinion bearing shafts unlocked and individually turned until the desired band shape and tightness are achieved and the shafts again locked, the conformance of the band to tooth shape being the result of the double stretching forces provided by the racks and pinions acting on the two halves of the soft-metal, varying thickness tang and on the non-slitted portion of the strip.

4,840,563

DENTAL EQUIPMENT HAVING MEANS FOR DELIVERING RF AND LF ENERGY TO A DENTAL HANDPIECE

Hans-Walter Altendorf, Worms, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 155,115
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706265; Nov. 17, 1987, 3739009
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—29 **26 Claims**



1. Dental equipment having means for providing energy from a supply part to a first dental handpiece containing a tool that can be placed into ultrasound oscillations by a resonator located in said first handpiece and to a second dental handpiece containing a surgical tool operable with radio-frequency current (RF energy), by use of a transmission cable connectable, first, to said supply part and, second, to said first and second handpieces, said transmission cable containing at least an inner conductor and a shielded line arranged coaxially thereabout comprising:

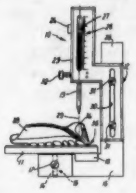
said equipment containing an additional supply source for generating a lamp voltage having a frequency in the range of zero (DC voltage) to a significantly lower-frequency in comparison to the frequency of the RF energy for the operation of first and second lamps located in said first and second handpieces respectively; and

said transmission cable provided for the transmission of, first, the RF energy and, second, the energy for the lamp, having a third conductor for the transmission of the lamp voltage for feeding the lamp, said third conductor being arranged relative to said shielded line such that a highly capacitive coupling exists between said shielded line and said third conductor.

4,840,564
DENTAL MEASURING APPARATUS

Alan J. Segal, 13 Park Avenue, Hale, Cheshire, WA15 9DL, United Kingdom

Filed Nov. 16, 1987, Ser. No. 120,844
Claims priority, application United Kingdom, Nov. 20, 1986, 8627776
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—72 10 Claims



1. A hand held operable dental measuring apparatus for taking measurements relative to a reference point on a denture, said apparatus comprising

a base plate providing a support surface for said denture,

a datum point on said surface,

a first scale for indicating distances from said datum point along a path in the plane of said surface,

a support means fixed to said plate and projecting upwardly therefrom to one side of said support surface clear of said datum point and said path,

a probe having an axis and having a tip thereto, said probe being mounted on said support surface clear of said datum point and said path,

a probe having an axis and having a tip thereto, said probe being mounted on said support means above said support surface with said tip aligned with said datum point, said probe being manually movable axially of itself to move said tip towards and away from said datum point,

means for restraining movement of said probe transversely to the said axis thereof;

a second scale for indicating the height of said tip above said datum point,

whereby by locating the denture on said support surface on top of said datum point and said path and manually moving the probe tip into contact with the said reference point on the denture, the height of the denture at said reference point on the denture, and the spacing of said reference point from a periphery of said denture can be determined respectively from the two scales.

4,840,565
TOOTH-DIE DOWEL-PIN AND LOCKING ASSEMBLY AND METHOD OF MAKING A DENTAL MODEL INCORPORATING SAID ASSEMBLY

Melvin D. Poveromo, 14135 N. Miami Ave., North Miami, Fla. 33161

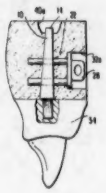
Filed Dec. 11, 1987, Ser. No. 131,787
Int. Cl.[4] A61C *19/00*
U.S. Cl. 433—74 13 Claims

1. A tooth-die dowel-pin and locking assembly for locking only an individual tooth-die in a dental model against movement in all directions, comprising:

an elongated dowel-pin means adapted to be secured to the base of only an individual tooth die, said dowel-pin means having a free end and a fastening end;

said dowel-pin means having first hole means which extends transversely therethrough between opposite ends thereof and which has spaced apart hole portions; and

locking pin means, having a free end and a grasping end, adapted to be transversely inserted through said first hole means and through corresponding mating second hole means in the base of a dental model, for locking said individual tooth die in the dental model against movement in all directions when said locking pin means is inserted

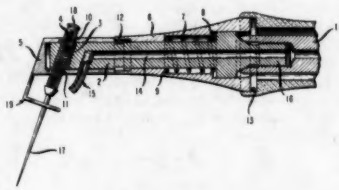


through said first and second hole means, said first and second hole means being transversely aligned with each other when the tooth die is inserted in the dental model.

4,840,566
DEVICE FOR MAINTAINING A BORING TOOL IN A VIBRATORY DENTAL INSTRUMENT

Henri Leonard, Besancon, France, assignor to Micro-Mega, Besancon, France

Continuation-in-part of Ser. No. 531,445, Sep. 12, 1983, Pat. No. 4,634,378. This application Jun. 2, 1987, Ser. No. 56,703
Claims priority, application France, Jun. 2, 1986, 86 08151
Int. Cl.[4] A61C *1/14*
U.S. Cl. 433—127 19 Claims



1. A tool holder for fastening a dentistry-type tool to be subjected to vibrations comprising a core to be attached to a generator of vibrations and having a housing;

a locking assembly cap is fitted onto a forward area of the core and having a rear end;

a tool to be subjected to vibrations supported in the forward area of the core and locked in position by the locking assembly cap;

a circlip attached to the core of a position following the locking assembly cap;

a locking assembly sliding component placed over a rear area of the core for contacting with a front end the rear end of the locking assembly cap and said circlip providing a stop to the locking assembly sliding component; and

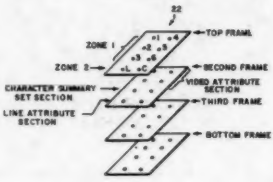
a compressive spring component engaging the core and the locking assembly sliding component for pushing the locking assembly sliding component in a forward direction whereby the forward displacement of the locking assembly sliding component under the pressure of the compressive spring is limited based on the presence of the circlip.

4,840,567

BRAILLE ENCODING METHOD AND DISPLAY SYSTEM

Timothe Litt, Waltham, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 16, 1987, Ser. No. 26,108
Int. Cl.[4] G09B 21/00
U.S. Cl. 434—114 **14 Claims**



1. A system for displaying text in Braille code, said text having characters with video attributes and being formatted for a visual presentation in which the characters have a predetermined relative spatial relationship with each other, said system comprising:

A. a digital data processor for storing and processing said text;

B. A Braille display terminal having an electro-mechanical Braille display cell for displaying Braille code;

C. cursor control means for selectively identifying a position in said text and the character located at said position, including attributes of said character;

D. first control means for hierarchically ordering a description of the identified character into a plurality of frames of information, said plurality of frames including a top frame and a bottom frame, wherein said top frame appears on the Braille display cell when said character is caused to be displayed on said display cell; and

E. frame selection means for causing a successive frame of said plurality of frames t be displayed on said Braille display cell whereby said successive frame replaces the frame previously displayed on said display cell,

whereby a substantially complete description of any character of text and its associated attributes can be displayed on a said Braille display cell by using said cursor control means to identify the position in text and then using said frame selection means to individually display the plurality of levels of information and whereby the formatting and relative spatial relationship of the characters in the displayed text are substantially preserved.

4,840,568

JACK ASSEMBLY

Dennis M. Burroughs, Savage, and Thomas W. Cruise, Coon Rapids, both of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 32,880, Mar. 31, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 243,180
Int. Cl.[4] H05K 7/10
U.S. Cl. 439—49 **14 Claims**

1. A jack assembly comprising:

a mount having a plurality of exposed electrical contact members disposed in a predetermined array;

a plurality of jacks having predetermined forward walls;

attaching means for releasably attaching each of said plurality of jacks to said mount with said jacks in side-by-side relation and with said forward walls exposed to an operator opposing said assembly, said attaching means accommodating individual removal of said jacks by said operator when opposing said forward walls and with said jacks removably insertable onto said mount by an operator placing a jack in an inserted position;

each of said jacks including a jack body formed of dielectric material, said bodies having an interior chamber and a plurality of bores extending through said forward walls in communication with said chamber, said bores sized to receive a plug of predetermined dimensions and having a tip contact and a ring contact;

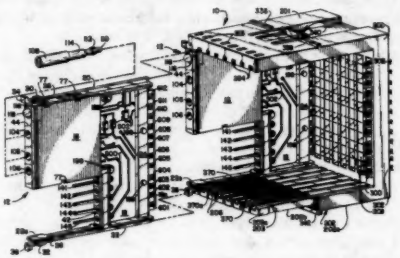
a plurality of electrically conductive spring contacts disposed within said chamber;

securing means for securing first ends of said spring contacts to said body with said first ends presenting electrical contact points disposed in a predetermined array;

said plurality of spring contacts including tip spring contacts disposed to make electrical contact with tip contacts of plugs inserted within said bores, said plurality further including ring spring contacts disposed to make electrical contact with ring contacts of said plugs, each of said jacks having a set of ring spring contacts and tip spring contacts;

connecting means for connecting a circuit board to said body;

said circuit board including circuitry having a first plurality and a second plurality of circuit contact points, said first plurality of circuit contact points disposed on said circuit



board to make electrical contact with said electrical contact points of said spring contact first ends when said circuit board is connected to said body, said second plurality of circuit contact points disposed for said second plurality to make electrical contact with predetermined ones of said plurality of exposed electrical contact members when said jack is attached to said mount in said inserted position;

a plurality of wire termination members secured to said body and having wire termination ends exposed outside said body to an operator facing said forward wall;

said plurality of wire termination members each having termination member contacts disposed in a predetermined array;

said circuitry including a third plurality of circuit contact points disposed on said circuit board to make electrical contact with said termination member contacts when said circuit board is connected to said body and means for electrically connecting said third plurality of circuit contact points to at least a portion of said plurality of spring contacts.

4,840,569

HIGH DENSITY ROTARY CONNECTOR

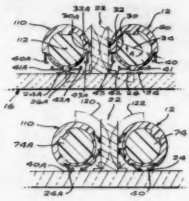
Michael K. Cabourne, Hacienda Heights, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,783
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—65 **12 Claims**

1. Apparatus for connecting together each of a plurality of conductive pads lying in a row on a first base, to a corresponding one of a plurality of pads lying in a second row on a second base, comprising:

an elongated bobbin having a pivot axis extending along its length;

an electrically conductive wire extending in multiple turns about said bobbin, with said turns spaced from one another along the length of the bobbin, and with said wire having at least one gap therein in each turn, each turn of the wire being attached to said bobbin along part of its length but having spaced contact portions forming



contacts that are free of attachment to said bobbin so each contact portion can deflect by bending of the contact portion, said contacts lying further from said pivot axis than adjacent portions of said wire turn;

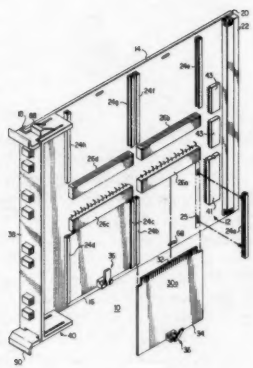
means for supporting said first and second bases and for supporting said bobbin in pivoting about said pivot axis at a distance from said rows to bring said contacts against and away from said pads as said bobbin pivots about said axis between first and second rotational positions.

4,840,570

PLUG-IN CARD MODULE

James A. Mann, Jr., Richardson, and E. Fletcher Haselton, Irving, both of Tex., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.

Filed Jun. 27, 1988, Ser. No. 211,589
Int. Cl.[4] H01R *23/72*
U.S. Cl. 439—74 **16 Claims**



1. A plug in card module for use in a rack module having means for supporting a plurality of plug in card modules in an abutting side by side relation, comprising:

a printed circuit board having first and second sides, a leading edge and a rear edge;

at least two pairs of card receiving and guiding rails transversely disposed on the printed circuit board, each of the pairs comprising first and second oppositely-disposed elongate rails secured to the printed circuit board;

first and second electrical connectors longitudinally disposed on the printed circuit board, each said electrical connector disposed adjacent an associated pair of said elongate rails; and

an electrical circuit board slidably supported in each pair of elongate guide rails, the electrical circuit board having a leading edge received in the associated electrical connector, and a rear edge; and

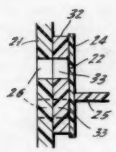
means which engages said printed circuit board and is supported on the rear edge of each electrical circuit board for locking a electrical circuit board, in the pair of said elongate rails and its associated said electrical connector.

4,840,571

HOUSING STRUCTURE FOR DECREASING A RADIO UNIT'S SUSCEPTIBILITY TO STATIC ELECTRICITY

Shigeki Minata, and Toshihiro Mori, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Division of Ser. No. 773,329, Sep. 6, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 132,706
Claims priority, application Japan, Sep. 10, 1984, 59-189139
Int. Cl.[4] H01R *9/09, 13/53*
U.S. Cl. 439—76 **3 Claims**



1. Apparatus comprising:

a housing;

a circuit board located in said housing and having an electronic component thereon, said electronic component being sensitive to static electricity;

an inner terminal plate including an inner terminal, said inner terminal being coupled to said circuit board and being electrically connected to said electronic component in such manner that static electricity applied to said inner terminal will be transferred to said electronic component, said inner terminal plate being fixed to said circuit board;

a housing opening formed in said housing in alignment with said inner terminals to permit an external pin of an external unit to pass through said housing and to contact said inner terminal, said inner terminal being spaced from and out of contact with said housing; and

a relatively airtight spacer, having resistivity to static electricity, which is interposed between the housing and said inner terminal plate surrounding said housing opening, and having an aperture communicating between said housing opening and said inner terminal.

4,840,572

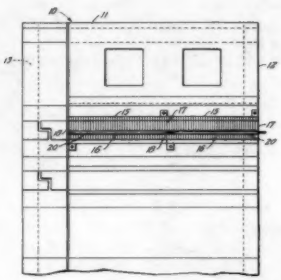
TELEPHONE CONNECTOR BLOCK HAVING SERIALLY INTERCONNECTIBLE GROUNDING STRIP

Paul V. De Luca, Plandome Manor, and Helmuth Neuwirth, Garden City, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed May 26, 1988, Ser. No. 199,057
Int. Cl.[4] H01R *9/24, 13/28*
U.S. Cl. 439—92 **2 Claims**

1. Telephone connector block construction comprising in combination: a plurality of connector blocks in abutted relation, each of said blocks having an exposed surface forming an elongated channel extending between first and second ends of said block, said channels communicating in end to end relation; an elongated ground strip element carried in each of said channels, and extending the length thereof, each of said ground

strip elements including first and second side walls, and an axially oriented bent interconnecting portion, one end of said side walls having flared extensions forming an entrance to a planar chanell formed between said side walls, a second end of each of said side walls having an offset portion leading to a



planar segment in abutted relation with respect to a corresponding planar segment on the other of said side walls to form a planar contact; whereby the placing of said connector blocks in abutted relation serves to engage said planar contact of one of said ground strip elements into engagement with a planar channel in an adjacent said ground strip element.

4,840,573

MECHANISM FOR CONNECTING SHIELDING CAPS OF MULTI-POLE PLUGS TO THE GROUND POTENTIAL LAYERS OF A MOTHER BOARD

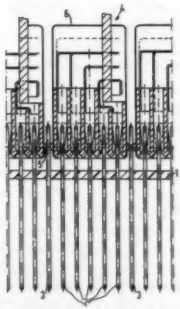
Peter Seidel, Groebenzell; Leo Pelzl, Holzkirchen, and Karl Zell, Niederpoecking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 165,420, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 829,620, Feb. 14, 1986, abandoned. This application Dec. 12, 1988, Ser. No. 284,788

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 35195961

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—92 **9 Claims**



1. Apparatus for shielding a multi-pole printed circuit card plug to a ground potential layer, comprising:

a mother board including the ground potential layer thereon;

a plurality of first contact elements perpendicularly extending to and through said mother board;

a plurality of second contact elements perpendicularly extending through and to said mother board and electrically connected to the ground potential layer;

a multi-pole connector plug including a plurality of third contact elements for respectively engaging said first contact elements when said multi-pole connector plug is plugged into said first and second contact elements; and

a conductive shielding cap mounted on said multi-pole connector plug and including spring elements for resiliently engaging said second contact elements when said multi-pole connector plug is plugged onto said first and second contact elements, said conductive shielding cap and said spring elements being of unitary formation, said shielding cap having shaped edges forming said spring elements.

4,840,574

MULTICONNECTOR

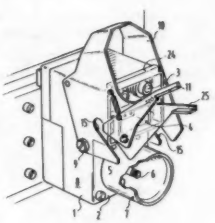
Simon F. Mills, Princes Risborough, United Kingdom, assignor to European Atomic Energy Community (Euratom), Luxembourg, Luxembourg

Filed Oct. 25, 1988, Ser. No. 261,872

Claims priority, application Luxembourg, Nov. 10, 1987, 87043; Feb. 2, 1988, 87125

Int. Cl.[4] H01R *4/60*

U.S. Cl. 439—191 **5 Claims**

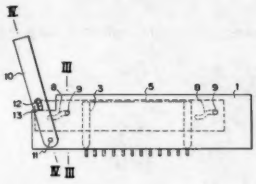


1. A multiconnector composed of a stationary socket unit and of a free plug unit, the system comprising means for aligning both units prior to any operative engagement of the individual connectors, wherein the means for aligning both units include, as an integral part of one of said units, a tube (**18**), having an outer shape which has a spherical front portion (**19**) followed by a conical portion (**20**) which extends up to a diameter equal to that of the sphere, the tube having an axis parallel to the alignment direction, and as an integral part of the second unit, a cylindrical chamber (**7**) positioned in coaxial alignment with said tube (**18**) and having a diameter corresponding with slight clearance to the sphere diameter, wherein at least one claw (**16**) is pivotably mounted on the plug unit, said socket unit including a shoulder, said claw latching behind said shoulder (**24**) of the socket unit (FIG. **1***a*) as soon as the conical portion (**20**) of the tube (**18**) penetrates into the chamber (**7**) during the mutual approach of the units, wherein an engagement lever (**10**) is mounted to the other unit, two cam followers (**14**) are mounted on opposite side surfaces of one of the units (FIG. **1***b*) and engage cam slots (**15**) in said engagement lever (**10**) mounted on the other unit such that if the units are aligned and the lever is then operated, the cam followers (**14**) penetrate into the cam slots (**15**) and move the two units up to a final position with connections (**3, 4, 5, 6**) operatively engaged.

4,840,575
CARD CONNECTOR

Noriyuki Matsuoka, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,931
Claims priority, application Japan, May 30, 1987, 62-136400
Int. Cl.[4] H01R 11/22, 13/62
U.S. Cl. 439—267 3 Claims



1. A card connector comprising:

a main body having a card insertion slit for receiving a card therein;

at least one resilient contacting piece attached to said main body and adjacent to said insertion slit, and each said at least one contacting piece having a contact surface means for contacting a card when a card is received in said insertion slit and for rubbing a card when a card is received in said insertion slit and is moved relative to said contact surface means when said at least one contacting piece is in a closed position against a card;

a single cam block reciprocably slidably received in said main body and adjacent to said insertion slit for reciprocating diagonally upwardly and downwardly;

force applying means attached to said single cam block for applying a substantially horizontal force for sliding said single cam block forwardly and rearwardly relative to said main body;

a guide means on said single cam block for causing said single cam block to move diagonally upwardly when said single cam block slides forwardly relative to said main body and for causing said single cam block to move diagonally downwardly when said single cam block slides rearwardly relative to said main body;

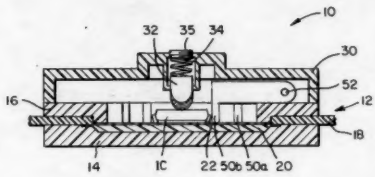
a card supporting surface on said single cam block for supporting a card received in said card insertion slit in said main body on said single cam block; and

a plain cam surface on said single cam block adjacent to said at least one resilient contacting piece for engaging said contacting piece for keeping said contacting piece and said contact surface means in a normally open position for receiving a card in said insertion slit and on said card supporting surface of said single cam block without contacting said contact surface means, and said plain cam surface causing said contacting piece and said contact surface means to move to the closed position against a card received in said card insertion slit on said card supporting surface when said single cam block moves forwardly and diagonally upwardly relative to said main body by said guide means from an initial position to an intermediate position, and said plain cam surface on said single cam block allowing said contacting piece and said contact surface means to remain in the closed position against a card received in said card insertion slit for rubbing a card against said contact surface means of said at least one contacting piece when said single cam block moves further diagonally upwardly by said guide means from the intermediate position to a final position when a substantially horizontal forward force is applied to said single cam block through said force applying means.

4,840,576
ZERO INSERTION FORCE SOCKET FOR SURFACE-MOUNTED INTEGRATED CIRCUITS

David Nierescher, Renton, and Douglas Yip, Bellevue, both of Wash., assignors to Data I/O Corporation, Redmond, Wash.

Filed Oct. 14, 1987, Ser. No. 108,775
Int. Cl.[4] H01R 13/62
U.S. Cl. 439—331 30 Claims



1. A zero insertion force socket for integrated circuits, comprising:

a base

a resilient circuit having a predetermined contact pattern on its upper surface, said resilient circuit being mounted on said base;

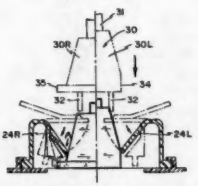
a rigid lid pivotally mounted on said base; and

a plunger slidably mounted in and projecting downwardly from said lid at a position located so that the lower end of said plunger contacts the upper surface of said integrated circuit when said lid is in its closed position, said plunger being resiliently biased downwardly away from said lid so that it resiliently biases said integrated circuit downwardly and facilitates the use of said socket with integrated circuits having cases of varying thickness.

4,840,577
PLUG LOCKING COVER

David Prouty, 72 Thomas Street, Exeter, Ontario, Canada N0M 1S0

Filed Sep. 28, 1987, Ser. No. 101,956
Int. Cl.[4] H01R 13/62
U.S. Cl. 439—373 8 Claims



1. In combination with a wall mounted power box carrying a female power receptacle, a cover plate adapted for releasingly engaging the marginal profile of a male electrical plug adapted to be inserted into, thereupon to cause electrical engagement therewith, or to be removed from the female power receptacle whereby the plug is constrainingly engaged into the receptacle by the cover plate, the cover plate comprising:

(a) an outer housing defining an upper essentially flat surface which itself defines a recess in the form of an "H" and hence the upper surface includes fingers, which lie in the plane of the surface, and which project toward each other so that their distal and lateral margins or edges define with the upper flat surface the "H" recess, while proximate ends of each finger merge integrally with and are part of the upper surface;

(b) means on the sides of the housing for fixedly engaging the housing onto the receptacle.

4,840,578

ELECTRICAL CONTACT

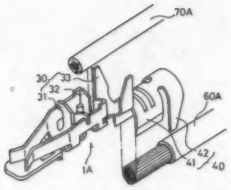
Kensaku Sato, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,601

Claims priority, application Japan, Oct. 30, 1986, 61-165797[U]; Dec. 25, 1986, 61-307691

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—395 8 Claims



1. An electrical contact having a generally U-shaped cross section, with a pair of side walls extending upright from a base plate, which comprises:

a contacting section provided at a front end of said contact for contact with a mating contact;

a connecting section provided behind said contacting section for connection to at least one conductor;

said connecting section having at least three piercing walls lying in spaced parallel planes each perpendicular to a longitudinal axis of said conductor;

said piercing walls each having a piercing slit which is made wider progressively toward a rear end of said contact; and

a pair of engaging means provided at opposite upper side edges of each said piercing wall for engagement with said side walls, whereby each said piercing wall is held firmly in place.

4,840,579

SLOTTED CONNECTION ARRANGEMENT FOR AN ELECTRIC WIRE, AND A CORRESPONDING CONNECTION TOOL

Jean-Paul Heng, Lyon; Ariel Ruiz, Villeurbanne, and Alain Boissonnet, Ampuis, all of France, assignors to CGEE Alsthom, France

PCT No. PCT/FR87/00387, § 371 Date Jun. 1, 1988, § 102(e) Date Jun. 1, 1988, PCT Pub. No. WO88/02935, PCT Pub. Date Apr. 21, 1988

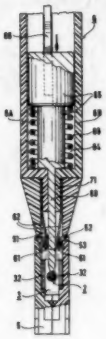
PCT Filed Oct. 8, 1987, Ser. No. 214,713

Claims priority, application France, Oct. 10, 1986, 86 14133

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—395 7 Claims

1. In a slotted connection arrangement for an electric wire (2), in particular for use in an electric junction block, wherein at least one connection part (3) is held in an insulating housing (5) provided with at least one opening extending over a slot (30) for the stripping and retaining the core of the wire and for providing electrical connection and which is located along a wall of said connection part, said opening enabling a wire to be connected to be inserted transversely over a wire-stripping opening (34) to the slot and also enabling the insulating sheath (21) of the wire to be subsequently held fast, the improvement wherein the housing is provide with at least one insertion orifice (51) for a rigid moving insertion blade belonging to an external tool, said blade being extended to slide along the slot while a wire is being inserted and said housing being provided with a device for positioning the tool via the insertion orifice, said device comprising a projection (52) having said insertion orifice (51) provided in the middle thereof and suitable for being received by translation in the end of the tool which includes said insertion blade, the inside of the insertion orifice being provided with latching rims (53) for moving fixing elements (61, 62) carried by the end of the tool and suitable for penetrating into the insertion orifice prior to the insertion blade



in order to latch onto the rims and thereby fix the tool relative to the insulating housing while the tool insertion blade is being actuated.

4,840,580

CONNECTOR ARRANGEMENT FOR A LEAD FOR AN IMPLANTABLE STIMULATION DEVICE

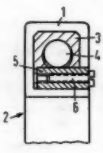
Goesta Saell, Norsberg, and Jakub Hirschberg, Taeby, both of Sweden, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,919

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718913

Int. Cl.[4] H01R *4/44, 4/50*

U.S. Cl. 439—431 9 Claims



1. In an implantable stimulation device having an electrode lead with a proximal end and a terminal portion of said device having a socket in which said proximal end of said lead is received, the improvement being a connector arrangement comprising:

means for fixing said proximal end of said lead in said socket to make a rigid mechanical and electrical connection, said means for fixing having a longitudinal axis; and

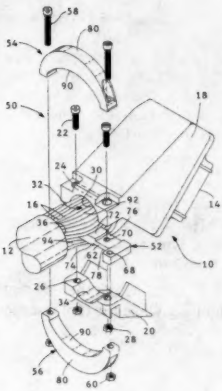
means in said terminal portion of said device for receiving said means for fixing such that the longitudinal axis thereof is tangential relative to said proximal end of said lead and substantially normal to the direction of insertion of said lead into said socket.

4,840,581

CABLE JACKET STRAIN RELIEF ADAPTER ASSEMBLY

Walter P. Leufert, Harrisburg, and David L. Miller, Landisville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1988, Ser. No. 288,747
Int. Cl.[4] H01R *13/595*
U.S. Cl. 439—472 **7 Claims**



1. An adapter assembly for being secured to a preexisting electrical connector assembly having first and second cover members securable together at a cable exit to define the cable exit for a multiconductor cable, the adapter assembly for providing improved cable strain relief when the electrical connector assembly including the adapter assembly is secured to the multiconductor cable, the adapter assembly comprising:

a mounting member and a pair of clamping members securable to said mounting member by securing means, said mounting member adapted to be mounted between facing portions of first and second cover members of the electrical connector assembly at a cable exit thereof, and said clamping members upon being secured to said mounting member and thereby secured to said electrical connector assembly engage and firmly clamp outer surface portions of an outer jacket of a multiconductor cable having conductors terminated to respective terminals within a housing of said electrical connector assembly.

4,840,582

MODULAR PLUG IDENTIFICATION TAG

Albert U. Marson, Riverview, Mich., assignor to Michigan Bell Telephone Company, Mich.

Filed Jun. 22, 1988, Ser. No. 210,318
Int. Cl.[4] H01R *13/50*
U.S. Cl. 439—491 **8 Claims**

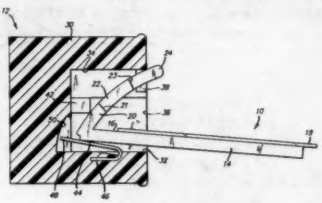
1. An identification tag for cooperating with a modular jack having a housing forming a cavity therein, said tag comprising:

a body portion to allow indicia to be placed thereon;

a tab portion connected to one end of said body portion; and

means for allowing pivotal movement between said tab portion and said body portion relative to each other;

whereby the tab portion is pivotally moved toward the body portion and both portions are partially inserted into the



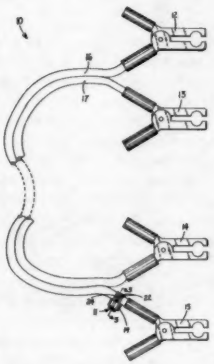
cavity and the tab portion is released to removably lock the tab within the cavity of the modular jack.

4,840,583

AUTOMATIC JUMPER CABLES

Donald M. Moore, Rte. 3, Box 109, Warrenton, Va. 22186

Filed Mar. 10, 1988, Ser. No. 166,404
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—504 **8 Claims**



1. An automotive jumper cable apparatus for use with direct current batteries comprising,

a first electrical conductive cable formed with first and second ends, and a second electrical conductive cable formed with third and fourth ends, and

first and fourth battery connector clamps are secured to said first and second ends respectively and second and third connector clamps are electrically secured to said third and fourth ends respectively;

said first second battery connector clamps comprise a first clamp couple means for attachment to respective terminals with a first direct current battery and said third and fourth battery connector clamps comprise a second couple means for attachment to a second direct current battery, and

a polarity indicator means electrically associated with said fourth battery connector clamp for testing polarity connection of said first and second battery clamp couples, and

said polarity indicator means including a LED element means electrically associated with a conductive probe means including an electrical insulator between said probe means and said fourth battery connector clamp;

said probe means positioned for temporary contact with a remaining battery terminal of said second battery when said first and second battery connector clamps are secured

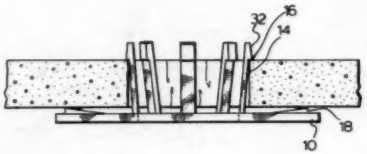
to said first battery and said third battery connector clamp is secured to a single terminal of said second battery, and wherein said polarity indicator means includes a torquing strap for securement about said first electrical conductive cable including a spike for penetration into said cable for providing electrical communication between said cable and said LED elements.

4,840,584

MOUNTING PLATE FOR ATTACHMENT OF ELECTRICAL CONTROLS AND ACCESSORIES TO WALLS AND THE LIKE

Michael Cox, 340 Kennedy St., Aurora, Ontario, Canada L4G 2L7

Filed Feb. 5, 1988, Ser. No. 152,819
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—538 **18 Claims**



14. A wall mounting plate adapted to allow an electrical device to be mounted thereto, comprising:

a generally planar base, having spaced from one side thereof a plurality of wall engaging surfaces facing said base;

said base interior to said wall engaging surface including an electrical wire receiving port;

a plurality of wall engaging contact areas spaced from said one side of said base exterior to said wall engaging surfaces and moveable against a bias towards said base, the spacing between said wall engaging contact areas and said wall engaging surfaces being variable by movement against said bias of said contact areas towards said one side of said base;

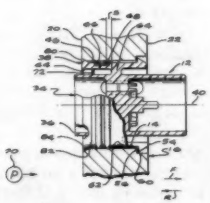
said plurality of wall engaging surfaces being associated with said plate to cooperate as a group during securement of said plate to a wall by passing through and aligning said port with a common opening in the wall.

4,840,585

BARRIER WALL CONNECTOR

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Sep. 6, 1988, Ser. No. 240,340
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—556 **10 Claims**



1. A connector for installation in a hole in a barrier wall wherein the barrier wall forms a connector-engaging wall surface at said hole and wherein a pressure differential can exist at opposite sides of the barrier wall with the pressure higher at a rear side of the wall than at a front side of the wall, comprising:

a connector frame with front and rear ends which can mount in said hole in said barrier wall, said frame having a frame axis and said frame including a radially inner portion and a skirt extending around said inner portion, said skirt having radially inner and outer sides;

an elastomeric seal mounted on said outer side of said skirt to bear against said wall surface at said hole;

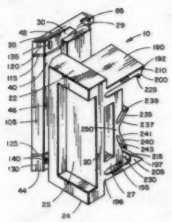
said frame having a connecting portion extending between said frame inner portion and said skirt at a location on said skirt spaced forward of said elastomeric seal, with said inner side of said skirt open to said higher pressure at said rear side of said barrier wall, whereby pressure at said inner side of said skirt tends to deflect the skirt to press the seal against the wall surface.

4,840,586

KEYING APPARATUS FOR CONNECTING A PRINTED WIRING ASSEMBLY TO A BACKPLANE STRUCTURE

Sherman G. Thomas, Earlysville, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Dec. 21, 1987, Ser. No. 135,799
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—680 **8 Claims**



1. A keying arrangement for preventing insertion and connection of an incorrect circuit board connector in a multiboard card rack comprising:

a circuit board including an edge surface and a key portion having at least one unique recess situated along said edge surface;

a key mating member having at least one protrusion for precisely mating with said key portion;

key support means adapted to receive said key mating member and for positioning said key mating member for mating with said key portion; and

mechanical attachment means, situated on said key support means, for attaching said key support member to said card rack.

4,840,587

COMPOSITE FEMALE CONTACT

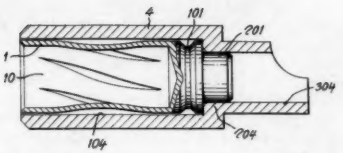
Attilio Lancella, Genova-Sestri, Italy, assignor to CONNEI S.p.A., Italy

Filed Mar. 7, 1988, Ser. No. 164,892
Claims priority, application Italy, Mar. 25, 1987, 12446 A/87
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—851 **4 Claims**

1. A composite female contact adapted to a receive a male contact of the pin type, in which, when the pin contact in not ionserted, the areas which establish electrical contact with the pin contact, upon insertion of same, are arranged at least approximately according to a family of straight generatrices of a hyperboloid of revolution of one branch, comprising:

an elastic contact element substantially in the form of a cylindrical sleeve made of a first suitable metal or metal alloy, said element having through slots arranged along its

cylindrical surface and inclined with respect to the longitudinal axis of the said sleeve, said sleeve being permanently deformed by having been twisted a predetermined angle directed in the sense of inclination of the slots,



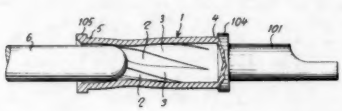
a housing body, made of a second suitable metal or metal alloy having different physical properties than the said first metal or metal alloy, and presenting a cavity adapted to house said contact element in a stable manner for its electric connection with any type of circuit.

4,840,588

SOCKET CONTACT FOR CONTACT DEVICES OF THE PIN AND SOCKET TYPE

Attilio Lancella, Genova-Sestri, Italy, assignor to Connei S.p.A., Italy

Filed Mar. 7, 1988, Ser. No. 164,906
Claims priority, application Italy, Mar. 25, 1987, 12447 A/87
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—851 **6 Claims**



1. A socekt contact for contact devices of the socket and pin type, in which, when the pin contact is not inserted, the areas of the socket contact which establish contact with the pin contact, upon insertion of same, are arranged at least approximately according to a family of straight generatrices of a hyperboloid of revolution of one branch, said socket contact having been formed by means of deformation by twisting through a predetermined angle of a hollow cylindrical sleeve of suitable metal, provided with through slots arranged along its cylindrical surface and inclined with respect to the longitudinal axis of said sleeve, said twisting being directed in the sense of inclination of the slots, wherein:

each slot is so shaped that prior to twisting deformation, it has a lance-head or lanceolate shape, the base of the slot being near the zone of maximum width of the slot and the apex of the slot terminating at the zone of the least width of the slot, the bases of the slots being arranged in proximity to the annular inlet zone of the sleeve.

4,840,589

UNDERWATER EXHAUST SYSTEM FOR BOATS OF STEPPED-HULL CONSTRUCTION AND INCLUDING EXHAUST COOLING

Vance V. Breaux, P.O. Box 146, Loreauville, La. 70552

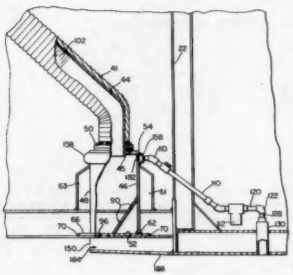
Continuation of Ser. No. 907,189, Sep. 12, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 220,366
Int. Cl.[4] B63B *1/34*
U.S. Cl. 440—89 **18 Claims**

1. An underwater exhaust system for use with the bottom of the hull of a boat oriented in its position of intended use and having an engine giving off exhaust gas, the bottom of the hull extending from the bow to the stern of the boat and being defined between port and starboard chines and being divided by a longitudinally extending centerline, said system comprising:

an exhaust box mounted in the interior of said hull, said exhaust box defining a hollow interior and having a top opening and bottom opening;

first pipe means for conveying the exhaust gas from said engine into the top opening of said exhaust box;

a step extending from the port chine to the centerline and then to the starboard chine transversely across the entire bottom of the port and the starboard portions of said hull, said step defining within said hull on each of said port and



starboard portions a generally planar recessed bottom aft of said step, said recessed bottom occupying a plane spaced from and being positioned inward relative to an imaginary generally planar surface defined by the aftward extension of the portion of said hull positioned forward of said step; and

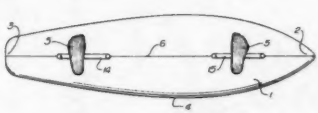
diffuser mean connected to said exhaust box and being positioned along the portion of said recessed bottom aft of said transverse step, said diffuser means for controlling the passage of the exhaust gas from said exhaust box along the exterior of said planar recessed bottom portion in an aftward direction.

4,840,590

SURFBOARD TRACTION BAR

Thomas J. Kelley, 919 Calle Amanecer St., Suite N, San Clemente, Calif. 92672

Filed Aug. 6, 1987, Ser. No. 83,115
Int. Cl.[4] B63B *35/72*
U.S. Cl. 441—74 **8 Claims**



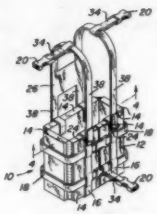
1. A surfboard traction bar formed of an elastomeric material, for mounting on the deck of a surfboard to comfortably engage the arch of the user's foot, said bar having an upper surface, opposing elevating surfaces, and a base surface, said base surface having means for mounting the bar on a deck, said upper and opposing surfaces having sufficient width and thickness, respectively, such that, when mounted and used, the bar engages the arch of the user's foot and allows both the front and rear portions of the foot to remain in contact with the deck on opposite sides of the bar.

4,840,591

BUOYANT SUPPORT APPARATUS AND SYSTEM FOR USE IN EXERCISING

Thomas G. Dulin, Trenton, N.J.; Eric Bass, and Richard M. Babyak, both of Doylestown, Pa., assignors to Therapeutic Systems, Inc., Doylestown, Pa.

Filed Nov. 6, 1987, Ser. No. 118,386
Int. Cl.[4] A63B *23/00*
U.S. Cl. 441—106 **24 Claims**



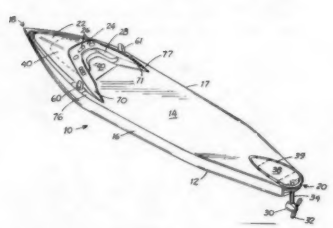
1. A buoyant device for exercising in water by an individual comprising a jacket to be worn closely about the trunk of the individual entirely below said individual's arm pits and about said individual's trunk, said jacket comprising a plurality of segments of buoyant material, covering means for encasing said segments of buoyant material in said jacket and for forming flexible joints interposed between said segments with the spacing between said segments being adjustable, and holding means for wrapping said jacket around the trunk of said individual so that said segments completely encircle said trunk, said holding means comprising at least one adjustable belt encircling said segments and interposed joints to adjust the spacing of said segments with respect to one another when said jacket is in place, whereupon said jacket is held in place by the frictional engagement of said covering means with the trunk.

4,840,592

POWER DRIVEN UNDERWATER VIEWING PLATFORM

Allen B. Anderson, P.O. Box 847, Big Fork, Mont. 59911

Filed Feb. 13, 1987, Ser. No. 14,590
Int. Cl.[4] B63C *11/00*
U.S. Cl. 441—135 **16 Claims**



1. An underwater viewing sled comprising:

an elongated flotation platform means for completely supporting a person above an upper surface of a body of water having a bow and stern and a deck portion and hull portion and comprising a rigid material;

viewing means extending through said platform from said deck potion to said hull portion and having a leading portion located a first predetermined distance aft of said bow and a trailing portion located a second, larger, distance aft of said bow;

propulsion means operably coupled to said platform means for propelling said viewing sled, said propulsion means mounted substantially at said stern of said platform means;

power source means operable coupled with said propulsion means for supplying power thereto;

cowling means attached to said deck portion and extending above part of said deck portion and said viewing means from said bow toward said stern, wherein a first portion of said cowling extends toward said stern a third distance exceeding said first distance but less than said second distance;

actuating means comprising an actuating control having a first variable position switch for propulsion speed control and regulation of said propulsion means, said actuating means being located in a first lateral position adjacent said cowling means and substantially at one side of said platform; and

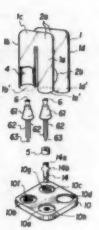
directional control means for directing the course of said sled and having a steering handle located in a second lateral position adjacent said cowling means opposite said first lateral position, said cowling means extendiang aftward of said actuating control and said steering handle.

4,840,593

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP AND PREPARATION THEREOF

Takao Takeda, Chigasaki; Hitoshi Yamazaki, Yokohama; Yoshiteru Taniguchi, Kamakura; Norihiko Tanaka, Kawasaki; Hiroshi Ito, Tokyo; Minoru Uchida, Yokosuka, and Jun Imai, Hiratsuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,451, Oct. 20, 1986, abandoned, Division of Ser. No. 861,724, May 12, 1986, Pat. No. 4,725,298, Division of Ser. No. 723,967, Apr. 12, 1985, abandoned. This application May 12, 1988, Ser. No. 195,380
Claims priority, application Japan, Aug. 12, 1983, 58-147618; Aug. 12, 1983, 58-147619; Sep. 6, 1983, 58-163611; Feb. 15, 1984, 59-26486; Feb. 15, 1984, 59-26487; Feb. 15, 1984, 59-26646
Int. Cl.[4] H01J *9/00*
U.S. Cl. 445—26 **5 Claims**



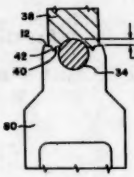
1. A process for preparing a low pressure mercury vapor discharge lamp comprising a bulb and an end plate firmly connected to the bottom of said bulb with an adhesive so as to close said bottom, which comprises a step of forming a groove in the surface of said end plate, a step of applying said adhesive in said groove where said bulb and a stem are to be bonded at a given position, a step of drying said adhesive applied to remove a solvent contained therein, a step of inserting into an insertion hole formed in said end plate a exhaust tube having an enlarged diameter portion of a diameter larger than that of said insertion hole for exhaust tube, said enlarged portion being on the same side of said end plate as said surface where said bulb and stem are to be bonded and said enlarged portion being formed on said exhaust tube at a position near the end of said bulb in said discharge lamp, while applying said adhesive at the upper part of said enlarged diameter portion followed by drying, and a step of putting said bulb and said stem on a given position of said adhesive applied to the surface of said end plate followed by melting and solidifying said adhesive.

4,840,594

METHOD FOR MANUFACTURING ELECTRODES FOR A SPARK PLUG

David J. Moore, Fostoria, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 6, 1988, Ser. No. 202,285
Int. Cl.[4] H01T *21/02*
U.S. Cl. 445—7 7 Claims



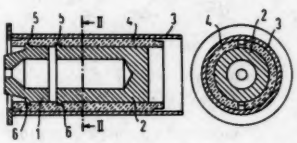
1. A method of manufacturing electrodes for a spark plug comprising the steps of:
cutting a piece of inconel wire from a source to define a cylindrical blank having a first end and a second end;
placing said cylindrical blank in a first die, said first die forming an extruded tip on said first end;
placing said cylindrical blank in a second die, said second die forming an extruded cup in said cylindrical blank that extend from said second end toward said first end;
inserting a copper core in said cup;
placing said cylindrical blank and copper core in a third die to extrude to a predetermined length between said first end and said second end for a resulting center wire;
carrying said center wire to a bath where at least said first end is cleaned to remove oil or grease that may have been accumulated thereon as a result of the extrusion of said cylindrical blank;
transporting said center wire in a station where a cylindrical hole is placed in said first end;
inserting a platinum sphere in said hole; and
striking said first end with a punch to produce an annular lip on said first end which engages and mechanically retains said platinum sphere in said hole.

4,840,595

ELECTRON BEAM CATCHER FOR VELOCITY MODULATED ELECTRON TUBES

Wilhelm Bibracher, Otterloh, and Josef Hauser, Bad Wiessee, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,914
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629461
Int. Cl.[4] H01J *25/34*
U.S. Cl. 445—28 5 Claims



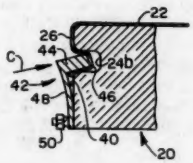
1. An electron beam catcher for velocity modulated electron tubes, particularly a multi-stage collector for traveling-wave tubes, comprising, a plurality of copper catcher electrodes which are mounted to surround the electron beam and follow one another in the direction of the axis of the electron beam, said plurality of catcher electrodes electrically insulated from each other, a copper outer envelope surrounding said plurality of catcher electrodes, a plurality of oblong insulator members (4, 4') extending in the axial direction and mounted between said plurality of catcher electrodes (1, 2) and said copper outer vacuum envelope (3) and said oblong insulator members are formed as half shells; and said copper outer vacuum envelope (3) shrunk onto said plurality of oblong insulator members (4, 4') such that said plurality of oblong insulator members (4, 4') are pressed between said plurality of catcher electrodes (1, 2) and said copper outer vacuum envelope (3).

4,840,596

FACTORY FIXTURE FRAME WITH MEANS FOR TEMPORARILY AND REMOVABLY SUPPORTING AN IN-PROCESS TENSION MASK FOR A COLOR CATHODE RAY TUBE

Lawrence W. Dougherty, Sleepy Hollow, and James L. Kraner, Barrington, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 31, 1987, Ser. No. 139,997
Int. Cl.[4] H01J *9/00*
U.S. Cl. 445—30 23 Claims



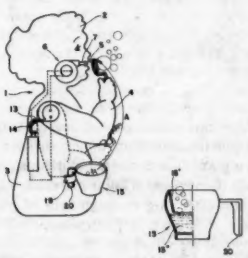
1. For use in the manufacture of a color cathode ray tube having a flat faceplate and a tensed foil shadow mask, a factory fixture frame for mounting an in-process shadow mask, the frame including peripheral elongate recess means for receiving an edge of the shadow mask, and mechanical mask-retaining means including elongate means positionable in said recess means for temporarily and removably supporting an in-process shadow mask in tension, and spring means being operatively associated between the frame and the elongate means for biasing the elongate means in clamping engagement with the edge of the shadow mask in the recess means.

4,840,597

DOLL WITH MEANS FOR PRODUCING SOAP BUBBLES AND HAVING AN ANTI-SPILL CONTAINER

Jose L. J. Perez, Biar Alicante, Spain, assignor to Jesmar S.A., Biar, Spain

Filed Jun. 17, 1987, Ser. No. 63,423
Claims priority, application Spain, Jun. 17, 1986, 294,821
Int. Cl.[4] A63H *33/28, 13/00*; A47G *19/22*
U.S. Cl. 446—16 9 Claims



6. A bubble blowing doll, said doll comprising:

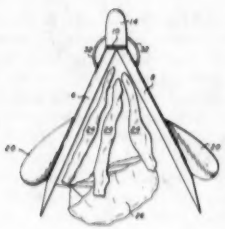
(a) a trunk;
(b) a receptacle for holding bubble making liquid, said receptacle having a first portion for containing said liquid when said receptacle is in an upright position and a second upper inner portion having a concavity within which said liquid remains contained in case said receptacle is moved from the upright position;
(c) an extremity pivotally mounted on said trunk;
(d) a bubble-making liquid, pick-up tool attached to the extremity;
(e) a head portion connected to said trunk, said head portion having an opening;
(f) an air impeller functionally connected to the opening in the head portion for impelling air through the opening;
(g) a battery-operated electrical circuit energizable to operate the air impeller; and
(h) a switching element connected to the electrical circuit for closing and opening the circuit and having a switching member located on said pivotally mounted extremity,
wherein, after the tool is placed in the receptacle and a film of liquid is formed thereon and when the extremity is then pivoted such that the tool is moved in an arc from in the receptacle to adjacent to the opening, the switching member on the extremity closes the electrical circuit and the air impeller is activated to cause bubbles to be produced from the film on the tool.

4,840,598

AMUSEMENT PROJECTILE DEVICE

Robert W. Schuetz, Rt. 2, Box 125-J, Beckley, W. Va. 25801

Filed Nov. 16, 1987, Ser. No. 120,955
Int. Cl.[4] A63H *33/20*
U.S. Cl. 446—52 4 Claims



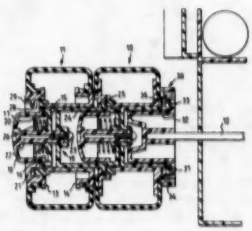
1. An amusement projectile device, comprising
(a) a longitudinal hollow body having a generally rectangular transverse cross sectional configuration, said body comprising a pair of longitudinal sections defining a cavity and hinged together at one end for movement between a closed position wherein said sections are adjacent one another and an open position wherein said sections are spaced from one another, the other ends of said body sections defining a tapered tail portion;
(b) a head portion connected with said hollow body adjacent the hinged connection of said body sections, said body having a convex top surface and containing a recess in one side surface thereof defining a projection portion for propelling the devices into the air;
(c) elastic biasing means connected between said head portion and said body sections to assist movement of said sections from the closed to the open position when the device is propelled into the air;
(d) first and second fins conneced with said body sections, respectively, adjacent said tail portion to assist in the flight of the device; and
(e) a plurality of streamer means arranged within said hollow body cavity, whereby with said body sections in the closed position, said body is propelled into the air and when said body reaches the apex of its flight path, said biasing means move said body sections to the open position to release said streamer means from said body cavity, said streamer means and said body falling randomly to the ground.

4,840,599

WHEEL FOR A TOY VEHICLE AND A TOY VEHICLE HAVING SUCH A WHEEL

Alex L. K. Ming, New Territories, Hong Kong, assignor to Unimax Distribution Limited, Kowloon, Hong Kong

Filed Jan. 29, 1987, Ser. No. 11,432
Claims priority, application United Kingdom, Jan. 30, 1986, 8602291
Int. Cl.[4] A63H *17/00*
U.S. Cl. 446—465 16 Claims



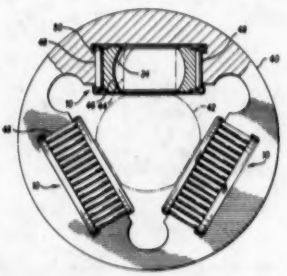
1. A wheel for a toy vehicle, comprising a coupling device for releasably and coaxially attaching the wheel to a hub mounted on an axle of a toy vehicle or to another wheel, the coupling device being supported relative to a rim of the wheel so as to be coaxial therewith and angularly movable relative thereto, the coupling device having a part on an outer side of the wheel for enabling the coupling device to be turned angularly, and a first part of a bayonet coupling on the inner side of the wheel for co-operating with a second part of a bayonet coupling on said hub or said another wheel, the wheel having a said second part of a bayonet coupling on the outer side of the wheel for co-operating with a said first part of a bayonet coupling on a like wheel.

4,840,600

LINEAR NEEDLE ROLLER BEARING

Craig E. White, Pineville, and Bobby L. Hodge, Matthews, both of N.C., assignors to INA Bearing Company, Inc., Fort Mill, S.C.

Filed May 8, 1987, Ser. No. 47,134
Int. Cl.[4] F16D *3/30*
U.S. Cl. 464—111 13 Claims



1. A linear needle roller bearing comprising:
a generally rectangularly shaped linear needle bearing block

having two opposed ends and an outer peripheral bearing surface extending between said ends, the corners of said bearing block being rounded, said outer peripheral bearing surface extending perpendicularly to said ends and forming a plurality of linear bearing surfaces;

an axial bore extending through the center of said linear needle bearing block;

a plurality of needle rollers disposed on the outer peripheral bearing surface, each of said needle rollers having two ends, a cylindrical rolling surface, a longitudinal axis and a predetermined length; and

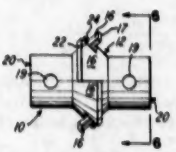
a pair of retaining members, each of said retaining members being fixed to a respective one of the ends of said block, each of said retaining members having a substantially C-shaped lip extending over one of said two ends of each of the plurality of needle rollers and a mounting portion, the mounting portion of each of said retaining members conforming generally to the shape of one of the opposed ends of said bearing block and being fixed thereto, said lip being formed so as to extend outwardly beyond the cylindrical rolling surfaces of said needle rollers and in a direction substantially parallel to the longitudinal axes of said needle rollers such that said lip is engageable and in retaining relationship with the cylindrical rolling surfaces of said needle rollers thereby retaining said needle rollers on said block.

4,840,601

SELF BALANCING UNIVERSAL JOINT

Stephen A. Denman, Centerville, Ohio, assignor to Jerome P. Bloom, Englewood, Ohio, a part interest

Filed Sep. 4, 1986, Ser. No. 903,662
Int. Cl.[4] F16D 3/18
U.S. Cl. 464—157 **18 Claims**



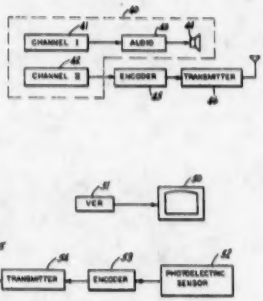
1. A universal joint comprising a pair of coupling devices each including a hub and means defining an extension of said hub, said means including a plurality of circumferentially spaced divergent projections which are longitudinally and laterally extended, have lateral extremities which are outwardly and symmetrically divergent and define the shape of a segment of a cone, said projections having their successively adjacent side surfaces formed to define therebetween spaces the bounding sides of which are similarly divergent and have a divergency similar to that of said projections, said extensions of said hubs being configured to interfit and being interfit with the projections of each thereof relatively rotatively displaced and projected in and through the spaces defined between the bounding sides of the projections of the other of said extensions, adjacent interfitting projections defining means to maintain a relatively controlled, sliding bearing engagement thereof, one to the other, regardless of the angle of displacement, roll and slide thereof in use.

4,840,602

TALKING DOLL RESPONSIVE TO EXTERNAL SIGNAL

William J. Rose, West Hartford, Conn., assignor to Coleco Industries, Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 11,600, Feb. 6, 1987. This application Dec. 2, 1987, Ser. No. 127,903
Int. Cl.[4] A63H 30/00, 3/28; G11B 31/00
U.S. Cl. 446—175 **8 Claims**



1. In combination, a talking toy and an external signal generating means, said talking toy including

(a) a central processing unit;

(b) a speech synthesizer including a digital to analog converter;

(c) a memory for storing speech data in digital form;

(d) a speaker coupled to said digital to analog converter to produce synthesized human speech, said central processing unit being arranged to access said memory to select speech data therefrom and supply said accessed data to said synthesizer, said speech data being stored in said memory in addresses which may be accessed to produce phrases of human speech; and

(e) a radio frequency receiver coupled to said central processing unit to receive a binary encoded signal indicative of speech data to be elicited from said memory; said external signal generating means including

(i) means for transmitting a radio frequency signal to said toy, said signal having binary encoded instructions for eliciting speech data from the memory of said toy; and

(ii) means for narrating a story to which speech comments from the toy are elicited.

4,840,603

DOLL AND METHOD FOR PRODUCING A DOLL

Mary J. Cahill, 387 Cypress Ave., Sunnyvale, Calif. 94086

Continuation-in-part of Ser. No. 828,329, Jan. 17, 1986, which is a continuation-in-part of Ser. No. 662,839, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 610,959, May 16, 1984, Pat. No. 4,629,441. This application May 1, 1987, Ser. No. 45,609
Int. Cl.[4] A63H 3/02, 3/36
U.S. Cl. 446—372 **24 Claims**

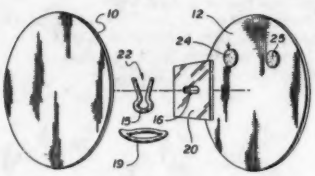
1. A method of forming features in a fabric doll face comprising:

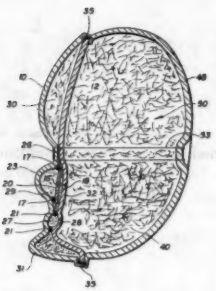
(a) outlining a feature on a front piece of fabric, the front piece of fabric being formed of stretchable material, the feature being in a form of a perimeter;

(b) attaching a middle cover of material that does not stretch to the front piece of fabric over the feature and forming a cavity therebetween and within the perimeter, the middle cover of material being smaller than the front piece of fabric;

(c) inserting filling material between the front piece of fabric and the middle cover inside the cavity; and

(d) attaching a rear piece of fabric to the front piece of fabric over the middle cover, the rear piece of fabric being





approximately the same size as the front piece and extending substantially beyond the feature.

4,840,604

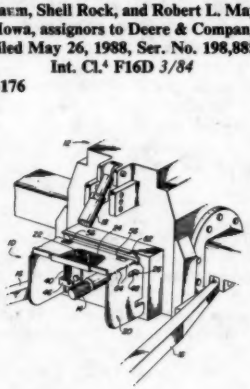
MASTER SAFETY SHIELD WITH DEFLECTING DOOR

David B. Nusbaum, Shell Rock, and Robert L. Mayfield, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 26, 1988, Ser. No. 198,885

Int. Cl.[4] F16D *3/84*

U.S. Cl. 464—176 **17 Claims**



1. A master safety shield for a power take-off shaft, comprising:

a U-shaped main body disposed above and around the power take-off shaft and having an opening in the central portion of the top thereof;

a pivotally mounted door for closing said opening and having a first position closing said opening and a second position spaced away therefrom; and

biasing means extending between said main body and said door for biasing said door into said first position.

4,840,605

REAR DERAILER FOR BICYCLE GEARS

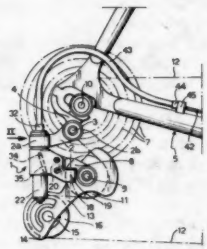
Sandro Testa, Pererolo, Italy, assignor to Campagnolo S.p.A., Vicanza, Italy

Filed Jul. 5, 1988, Ser. No. 215,155

Claims priority, application Italy, Jul. 2, 1987, 67569 A/87

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—80 **12 Claims**



1. A rear derailleur for bicycle gears, comprising:

an upper body which can be fixed to the bicycle frame,

a lower body carrying transmission means for the bicycle chain and connected to the upper body so as to be movable relative thereto to bring the chain into selective engagement with a series of sprockets carried by the hub of the rear wheel of the bicycle, and

flexible cable means for causing movement of the lower body,

wherein it further includes a cylindrical guide element fixed to the upper body, a control lever which carries the lower body and is supported for rotation and axial sliding on the cylindrical guide element, and transmission means interposed between the flexible cable means and the control lever for simulaneously imparting rotation and axial sliding to the control lever relative to the cylindrical guide element as a result of operation of the flexible cable means, means also being provided for keeping the orientation of the lower body unchanged as the position of the control lever varies.

4,840,606

SYNCHRONOUS DRIVE SYSTEM AND METHOD OF MAKING THE SAME

Robert E. Wetzel, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 927,205, Nov. 5, 1986, Pat. No. 4,722,721, which is a division of Ser. No. 883,257, Jul. 8, 1986, Pat. No. 4,679,999, which is a continuation of Ser. No. 671,392, Nov. 15, 1984, abandoned. This application Jan. 25, 1988, Ser. No. 147,392

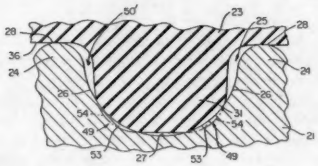
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] F16G *1/28;* F16H *7/02*

U.S. Cl. 474—153 **30 Claims**

1. In the combination of a toothed pulley and a toothed belt that has teeth thereof serially mesh with cavities of said pulley that are respectively disposed between adjacent teeth thereof and that respectively have bottoms, each belt tooth having a longitudinal crosssectional configuration that defines a pair of space side face means that respectively have free end portions thereof that are remote from adjacent root means thereof and that are spaced apart from each other by a bottom face means of said tooth, each bottom face means having a center that defines a radial length of that respective belt tooth that is at least as long as any other radial length of the respective belt tooth, said belt having land areas on each side of each belt

tooth, the improvement wherein said teeth of said pulley and said belt are so constructed and arranged that each belt tooth would have said pair of free end portions thereof compressed radially outwardly and inwardly toward each other by the respective adjacent pulley teeth while said bottom face means thereof has said center thereof spaced from said bottom of the



cavity between those respective adjacent pulley teeth when that belt tooth is fully received in the cavity between those respective adjacent pulley teeth and those respective adjacent pulley teeth are just making contact with the land areas of the belt on each side of that belt tooth while being spaced from the respective root means of that belt tooth.

4,840,607

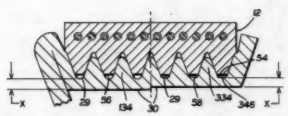
PULLEY FOR POLY-V BELT

Gary L. Hitchcock, Rochester, Mich.; Henry W. Thomey, Windsor, Canada; Yahya Hodjat, Utica, Mich.; Marc R. Cadarette, and Dawson M. Collins, both of Windsor, Canada, assignors to Dyneer Corporation, Scotsdale, Ariz.

Filed Jun. 26, 1987, Ser. No. 67,621

Int. Cl.[4] F16H *7/02*

U.S. Cl. 474—167 **14 Claims**



1. A pulley for transmitting power to or from an adjacent "K" type poly-v belt, said belt having alternatively raised and indented areas running in parallel longitudinally on said belt, comprising:

(a) a body including an outer cylindrical surface;

(b) a plurality of raised ribs extending from said outer surface, said ribs running circumferentially about said surface and corresponding with the indented areas of said belt;

(c) a plurality of trough areas between said ribs in correspondence with the raised areas of said belt;

(d) said ribs extending radially traverse of the axis of rotation of said pulley, each of said ribs in cross section bounded by a pair of planar side walls at relative angles of 40°±0.5° and terminating in a 140° arc having a radius of 0.50 mm, an outermost point of said arc 0.96 mm below a point of intersection of projections of said side walls, and said side walls extending at least 3.44 mm in the traverse direction inward of said point of intersection.

4,840,608

TOOTHED BELT

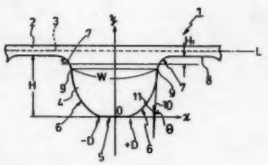
Junichi Araki; Nobuhiro Saito; Hidenori Tezuka, and Masuhiro Saito, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,789

Claims priority, application Japan, Jul. 28, 1986, 61-175720

Int. Cl.[4] F16G *1/28*

U.S. Cl. 474—205 **38 Claims**



1. A toothed belt for use in a power transmission system, said belt having elastic, longitudinally spaced teeth including a tooth tip with intermediate bottom lands for meshing with cooperating teeth of a toothed pulley, each said belt tooth having a longitudinal sectional shape comprising a cycloidal convex curve extending from the tooth tip and an arc smoothly connecting said cycloidal convex curve and said bottom land.

4,840,609

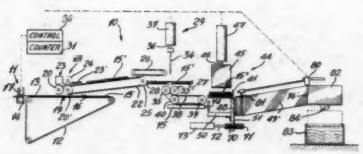
BAG FOLDING MACHINE

Elwyn D. Jones, Kingston; Robert Lauzon, Montreal, and Bruno Wetter, St-Eustache, all of Canada, assignors to Glopak Inc., Montreal, Canada

Filed Aug. 25, 1987, Ser. No. 89,155

Int. Cl.[4] B65H *33/02, 33/08, 37/06, 45/30*

U.S. Cl. 493—28 **43 Claims**

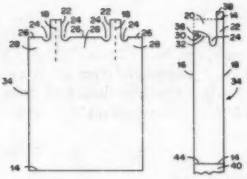


1. A bag folding machine comprising first conveying means for positioning a flat bag over a first support surface, holding means to hold said flat bag stationary over said first support surface in predetermined alignment with a first folding means, said first folding means effecting a first fold to said flat bag, second conveying means for positioning said folded bag on a second stationary support surface, second folding means for effecting a second fold to said folded bag, and third conveying means for positioning said twice folded bag onto a third stationary support surface, third folding means for imparting a third fold to said twice folded bag and including a bag support frame having spaced apart upper and lower bag engaging members for retaining an upper and a lower edge portion of said bag after being folded a third time and with said bag oriented substantially vertically, drive coupling means to move said bag support frame to a discharge position, and discharge means to push said bag out of engagement by said bag engaging members to transfer same to a collector means.

4,840,610
THERMOPLASTIC BAG, BAG PACK AND METHOD OF MAKING THE SAME

Timothy W. Pistner, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 675,109, Nov. 26, 1984, Pat. No. 4,790,437.
This application Sep. 14, 1988, Ser. No. 243,968
Int. Cl.[4] B31B *1/64*
U.S. Cl. 493—194 8 Claims



1. A method for forming thermoplastic film handled bags comprising:

(a) forming a continuous collapsed thermoplastic tube;

(b) forming heat seal lines across the width of said tube, transverse to the tube sides, at bag length intervals, said heat seal lines being sufficient to seal the films of said collapsed tube together and preweaken said line for subsequent bag separation;

(c) longitudinally folding opposite sides of the heat sealed tube equally toward each other until they at least substantially meet at a common center line;

(d) folding this structure once again in the same direction along said center line;

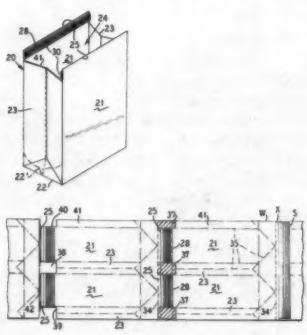
(e) removing eight film layers in one of the corner regions defined by a transverse heat seal line and the spine of fold (d), the film removal being such as to yield, on unfolding, a bag having a bag mouth opening and a pair of single film loop handles near opposite ends of said bag mouth opening but spaced from the sides; and

(f) collecting while still folded, the interconnected structures of (e) in a volumetrically efficient pack of bags.

4,840,611
GUSSETED BAGS WITH RECLOSURE FEATURES

Donald L. Van Erden, Wildwood, Ill., and Steven Ausnit, New York, N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 799,790, Nov. 20, 1985, Pat. No. 4,736,450.
This application Dec. 31, 1987, Ser. No. 139,969
Int. Cl.[4] B31B *1/84*
U.S. Cl. 493—213 3 Claims



1. A method of making bags having opposite face wall panels connected by a closed bottom, opposite side expanding gussets, and a top opening providing a bag mouth, comprising:

providing a web of a length from which a plurality of bags can be produced by separating the web across its length into bag length sections;

securing across the web on axes extending between opposite longitudinal sides of the web and at bag mouth ends of said bag length sections fastener strips comprising extruded reclosable plastic profiles;

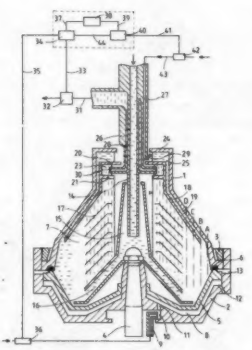
and punching out portions of the web and the secured fastener strips aligned with areas of the web to be formed into said expanding gussets;

and leaving lengths of the fastener strips on portions of the web which will form free end bag mouth portions of face wall panels of the bag length sections and which face wall panels are foldable onto one another along a line which extends across said fastener strip axes.

4,840,612
CENTRIFUGAL SEPARATOR AND METHOD OF OPERATING SAME

Anders Pallmar, Huddinge, Sweden, assignor to Alfa-Laval Marine and Power Engineering AB, Tumba, Sweden

Filed Jun. 17, 1988, Ser. No. 208,105
Claims priority, application Sweden, Jun. 24, 1987, 8702612
Int. Cl.[4] B04B *11/00*
U.S. Cl. 494—2 9 Claims



1. In the operation of a centrifugal separator having a rotor, a separation chamber in said rotor, said chamber having an inlet for liquid feed mixture, a central outlet for separated liquid and a peripheral outlet for separated solids, opening means for opening and closing the peripheral outlet during operation of the rotor, means for supplying a predetermined amount of a displacement liquid heavier than said separated liquid to the separation chamber and control means for activating said supply means to supply displacement liquid to said separation chamber immediately prior to the opening of said peripheral outlet, the improvement which comprises:

a. supplying a first quantity of displacement liquid to said separation chamber at a first flow rate and then supplying a second quantity at a substantially lower rate;

b. detecting the possible existence of displacement liquid in the separated liquid leaving the rotor through the central outlet; and

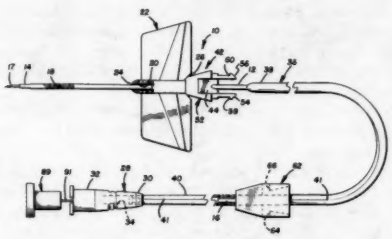
c. opening the peripheral outlet in response to the detection of displacement liquid in the separated liquid.

4,840,613

PROTECTIVE SHEATH FOR CATHETER ASSEMBLY

Daniel J. Balbierz, Sunnyvale, Calif., assignor to Menlo Care, Inc., Palo Alto, Calif.

Filed Apr. 27, 1988, Ser. No. 186,560
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—51 **18 Claims**



1. In a catheter assembly having a cannula having cannula distal and proximal end portions and a longitudinal duct therethrough from the cannula distal end portion to the cannula proximal end portion, an inserter having inserter distal and proximal end portions and a guide channel therethrough from the inserter distal end portion to the inserter proximal end portion, the cannula slidably fitting in the guide channel, and a hub structure having hub distal and proximal end portions and a passageway therethrough from the hub distal end portion to the hub proximal end portion, the cannula proximal end portion being attached to the hub structure with the duct in flow communication with the passageway, an improvement comprising:

a sheath having sheath distal and proximal end portions and a longitudinal slit or weakened portion extending therealong from said sheath distal end portion to said sheath proximal end portion, said sheath being about said cannula between said inserter and said hub structure;

sheath stripping means carried by said inserter for stripping said sheath, starting from said sheath distal end portion, from about said cannula as said cannula is slid distally through said guide channel;

a first lock member carried by said inserter; and

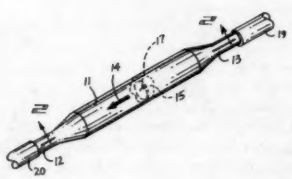
a second lock member about said cannula between said inserter and said hub structure, said first and second lock members being interlockable with on another.

4,840,614

GASTRIC TUBE POSITIONING METHOD

Bassam Maaz, 637 Avant La., N., Memphis, Tenn. 38105

Filed Jan. 4, 1988, Ser. No. 140,612
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—53 **1 Claim**



1. A method for proper positioning of a gastric feed tube within a patient comprising,

securing a first gastric tube portion onto a forward end of a valve means, and

securing a second gastric tube portion onto a rearward end of said valve means, and

directing said second gastric tube portion through a patient's esophagus, and

temporarily positioning a terminal end portion of said first gastric tube portion within a liquid and observing the liquid for presence of bubbling emanating from said terminal end within said liquid to ascertain the positioning of the second gastric tube portion either within a patient's stomach wherein no bubbling occurs, or within the patient's gastric tube portion by the presence of bubbling within said liquid, and

further forming said valve means with an internal flexible membrane normally seated over a defined opening within said valve means enabling fluid flow from said rearward end of said valve means to a said forward end of said valve means only, and

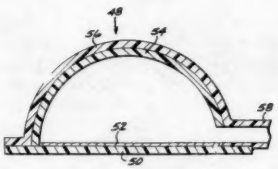
forming said flexible membrane of a memory retentent material and of a force to normally seat said membrane against a frame portion defining said opening wherein said normal forces of seating is less than that of exhalation pressure of an individual during a normal respiratory process.

4,840,615

SELF-SEALING INJECTION RESERVOIR

John C. Hancock; William R. Dubrul, both of Santa Barbara, and Charles J. Heyler, III, Thousand Oaks, all of Calif., assignors to McGhan Medical Corporation, Santa Barbara, Calif.

Division of Ser. No. 781,965, Sep. 30, 1985, Pat. No. 4,738,657.
This application Mar. 14, 1988, Ser. No. 167,409
Int. Cl.[4] A61M *25/00*; A61B *19/00*
U.S. Cl. 604—93 **9 Claims**



1. A self-sealing injection reservoir adapted to be punctured by a hypodermic needle, the reservoir comprising:

a body defining a chamber for holding liquid, said body including a base;

a substantially dome-shaped member made of elastic material and having a concave interior side which is under compression as a result of having been manufactured into a substantially dome-shaped configuration and thereafter inverted, the dome shaped member comprising at least an interior wall of the chamber and being disposed in a locaion of the chamber which is adapted to be punctured by the hypodermic needle;

duct means for conducting liquid out of the chamber, and

guard means incorporated in the chamber for preventing accidental puncture of the base with the hypodermic needle.

4,840,616

SYRINGE HYPODERMIC NEEDLE

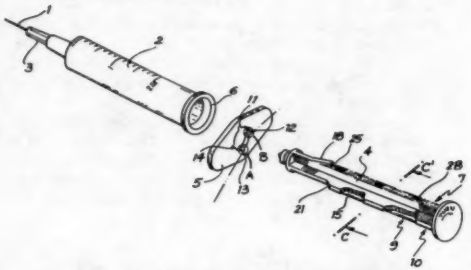
Gilbert H. Banks, Rainbow Flats, Australia, assignor to Bev-Cap Plastics Pty. Ltd., New South Wales, Australia

Filed Feb. 29, 1988, Ser. No. 161,574
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 **9 Claims**

1. A single use disposable medical syringe comprising a syringe body adapted at one end to receive a hypodermic

needle, a plunger located within said syringe body and passing through an end plate attached to other end of said syringe body and characterised in that:

said plunger includes a plunger head forming at any time a seal with an interior surface of said syringe body, and a plunger shaft including at least a first and second longitudinally extending spline, said first spline including teeth adapted to co-act with a first pawl and said second spline including teeth adapted to co-act with a second pawl, said splines further including circumjacent and corresponding first and second recesses;



said end plate having an aperture to locate said plunger shaft, said aperture having three or more channels each adapted to receive one or other said splines and two of said channels being provided respectively with said first and second pawls;

said recesses allowing free rotation of said plunger within said end plate aperture such that when said first pawl allows withdrawal only of said plunger whereupon predetermined free rotation of said plunger engages said second pawl which allows insertion only of said plunger.

4,840,617

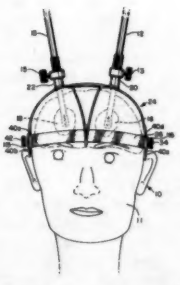
CEREBRAL AND LUMBAR PERFUSION CATHETERIZATION APPARATUS FOR USE IN TREATING HYPOXIC/ISCHEMIC NEUROLOGIC TISSUE

Jewell L. Osterholm, Radnor, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 755,427, Jul. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 428,900, Sep. 30, 1982, Pat. No. 4,758,431, and a continuation-in-part of Ser. No. 582,961, Feb. 23, 1984, Pat. No. 4,686,085, which is a division of Ser. No. 428,850, Sep. 30, 1982, Pat. No. 4,445,500, said Ser. No. 428,900, and Ser. No. 428,850, each is a division of Ser. No. 354,346, Mar. 3, 1982, Pat. No. 4,445,886, which is a continuation-in-part of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797. This application Aug. 24, 1988, Ser. No. 238,982

Int. Cl.[4] A61M *25/02, 5/00, 1/00*; A61B *19/00*

U.S. Cl. 604—174 **21 Claims**



1. A cerebral catheterization apparatus for delivering oxygenated nutrient to or from the cerebro-spinal fluid pathway of a patient suspected of suffering from ischemic central nervous system tissue comprising:

(a) catheter means for providing a delivery pathway for said oxygenated nutrient to the lateral ventricle of the brain of said patient, said delivery pathway comprising an inlet and outlet;

(b) guide means, mating with said catheter means, for directing said catheter means toward said lateral ventricle; and

(c) a harness, positionable with respect to the head of the patient, said guide means being mounted thereon, for positioning said guide means with respect to the head such that said catheter means may be reliably inserted into said lateral ventricle, said harness comprising:

(i) a horizontal strap for encircling the head of the patient, the ventrex of the skull being above said horizontal strap; and

(ii) a transverse strap coupled to said horizontal strap, said transverse strap generally lying above the coronal suture of said patient and lying in a generally vertical plane which intersects with the lateral ventricles, to thereby position said guide means at a predetermined location with respect to said ventricles, said guide means being mounted on said transverse strap.

4,840,618

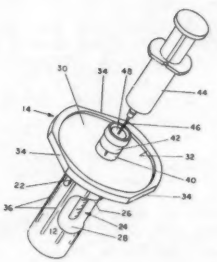
MEDICAL SAFETY DEVICE

Ray D. Marvel, 3206 Highway 92, Hotchkiss, Colo. 81419

Filed Apr. 25, 1988, Ser. No. 185,855

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—187 **14 Claims**



1. Apparatus for providing a safety shield to an operator in the process of transferring body fluids from a syringe to a test container which comprises:

a handle for holding the safety shield in the hand of an operator, said handle having the form of an elongated, substantially cylindrical member with a longitudinal dimension which is sufficient to extend transversely across the palm of the operator's hand and having formed therein a longitudinal cavity within the substantially cylindrical member that is long enough to receive the greater part of a test container lengthwise, said cavity being sized for securely holding the test container and

a shield extending radially outwardly from the upper end of the handle to a distance such that when the handle is grasped within the operator's palm to form a clenched fist about the handle, the bottom surface of the shield substantially covers the upper side of the clenched fist.

4,840,619
SYRINGE

Elaine L. Hughes, 3009 Castle Dr., Blue Springs, Mo. 64015

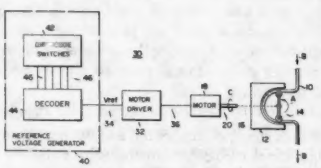
Filed May 26, 1988, Ser. No. 199,323
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—187 10 Claims

1. A syringe for administering injections comprising:
(a) a barrel having an interior chamber for holding fluid;
(b) a plunger reciprocably located in said chamber and manipulative by an administer of an injection;
(c) a needle having an end point in flow communication with one end of said chamber;
(d) said needle including a projection extending radially outward therefrom; and
(e) a sleeve slidably mounted on said barrel and including means for engaging said needle projection subsequent to administration of said injection such that an administrator may engage said needle projection with said means by sliding said sleeve along said barrel and subsequently disconnect said needle from said barrel by rotation of said sleeve.

4,840,620
PORTABLE PUMP FOR INFUSING MEDICINE INTO A LIVING BODY

Susumu Kobayashi, and Kazumasa Satoh, both of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 33,772
Claims priority, application Japan, Apr. 7, 1986, 61-78288
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—246 5 Claims

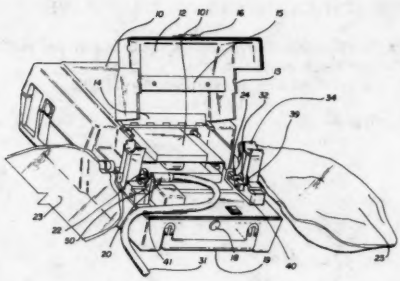


1. An infusion rate control apparatus for controlling an infusion pump powered by a motor, comprising:
driving means for driving the motor of the infusion pump in response to a control signal;
speed setting means, including a dual in-line package code switch having a control knob that is manually operated to set in said speed setting means a decimal value corresponding to a desired speed of the motor, for producing a binary-coded signal in dependence upon the decimal value set therein, the dual in-line package code switch and the control knob together providing a visual indication representative of a flow rate at which the liquid is to be transported;
control signal producing means, interconnected with said speed setting means, for producing the control signal in dependence upon the binary coded signal and supplying the control signal to said driving means.

4,840,621
PIERCING PIN TRANSFER DEVICE

Mark E. Larkin, Lindenhurst, and John E. Ogden, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 19, 1988, Ser. No. 145,008
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—29 27 Claims



1. A piercing pin transfer device comprising, in combination
a piercing pin;
means to support said pin;
means for holding a first port adapted to connect to said pin;
means for holding a second port adapted to connect to said pin, said second port holding means being in opposing relationship with said first port holding means;
means for connecting said pin to said first port, disconnecting said pin from said port, and connecting said pin to said second port and
means for inverting said piercing pin intermediate of said first port holding means and said second port holding means.

4,840,622
KINK RESISTANT CATHETER

Dwayne E. Hardy, San Mateo, Calif., assignor to Menlo Care, Inc., Palo Alto, Calif.

Filed Oct. 6, 1987, Ser. No. 105,552
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—264 46 Claims

1. In a cannula having a proximal end portion adapted to be connected to a hub, a distal end portion and a longitudinal duct therethrough from the distal end portion to the proximal end portion, the cannula being of a material selected such that an

inner cross-section of the duct increases to form an enlarged duct cross-section when at least a part of the distal end portion is inserted through the skin and into a blood vessel of a living subject and maintained therein and/or when the duct is contacted by an aqueous liquid for a period of time sufficient for the enlarged duct cross-section to form, an improvement comprising:

where in the cannula has a larger outer cross-section and the duct has a larger inner cross-section starting from the proximal end portion and continuing to a position along the cannula than have the cannula and the duct starting at the distal end portion and continuing to the position, the position being located such that when the distal end portion is inserted in the blood vessel the position is located beneath the skin short of the blood vessel; and further including:

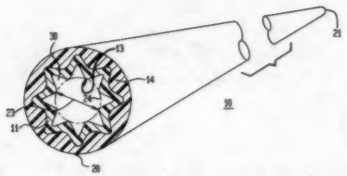
a reinforcing tube having an outer surface matingly held within the duct and having an inner passageway, the tube extending from the proximal end portion to adjacent the position.

4,840,623

MEDICAL CATHETER WITH SPLINED INTERNAL WALL

John Quackenbush, Hoover, Ala., assignor to FBK International Corporation, Birmingham, Ala.

Filed Feb. 1, 1988, Ser. No. 151,061
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 **5 Claims**



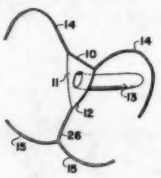
1. A catheter adapted for insertion into the human body, said catheter including a flexible tube having an internal and an external wall, said internal, wall having a splined configuration, and having an outer shell, said outer shell having an internal wall and an external wall, said internal wall of said outer shell having a geometry to match the geometry of the external wall of said inner tube and being integral herewith.

4,840,624

FEMALE CONDOM DEVICE

Henry J. Lee, 2521 Harriman Cir., Tallahassee, Fla. 32312

Filed Sep. 24, 1982, Ser. No. 100,426
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—349 **3 Claims**



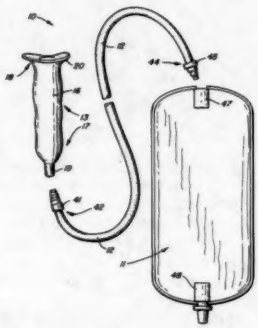
1. A female condom device comprising a triangular pubic area cover pad having a front side and a back side, a thin elastomeric tubular condom portion affixed to said pad with the opening of said condom portion generally in the center of said front side and the closed end of said condom extending outwardly from said back side, and two hip engaging elongated loops of tape extending outwardly from the three corners of said pad; said condom portion having an expandible constricting encirclement spaced rearwardly from and adjacent to said cover pad.

4,840,625

EXTERNAL CATHETER URINE COLLECTION SYSTEM

Ramona R. Bell, 3708 Magee Ave., Oakland, Calif. 94619

Filed May 27, 1988, Ser. No. 199,622
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—352 **2 Claims**



1. An external catheter urine collection system for males, comprising:

a lightweight urine collection reservoir made of flexible material and having a urine collection inlet,

a lightweight urine collection tube made of flexible material, having a reservoir connecting end for connecting to the inlet of the urine collection reservoir, and a catheter connecting end means, and

an external catheter having a distal end and a proximal end, the proximal end having a diameter and length sufficient to fit over a male patient's penis and be positioned at the base of the penis, the distal end including connector means for connecting the catheter to the catheter connecting end of the urine collection tube, so that urine may flow from the catheter into the urine collection tube, and the proximal end including adhesively sealing rim means for sealing the proximal end of the catheter only to the body skin adjacent to and around the base of the patient's penis, thereby adhesively securing the catheter to the patient and preventing leakage of urine from around the proximal end of the catheter,

the external catheter including a generally annular sheet of material sealed to and extending around the proximal end of the external catheter, said sheet having an adhesive coated proximal side in position to contact and sealingly adhere to the patient's skin adjacent to the base of the penis,

the annular sheet being radially asymmetrical around the proximal end of the external catheter so that when the catheter is properly attached to the patient, no portion of the annular sheet rest substantially on the patient's scrotum.

4,840,626

HEPARIN-CONTAINING ADHESION PREVENTION BARRIER AND PROCESS

Gary Linsky, East Brunswick; Timothy Cunningham, Flemington, and Eli Pines, Watchung, all of N.J., assignors to Johnson & Johnson Patient Care, Inc., New Brunswick, N.J.

Filed Sep. 29, 1986, Ser. No. 912,450
Int. Cl.[4] A01F *13/16*
U.S. Cl. 604—364 18 Claims

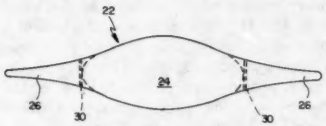
1. An improved adhesion-preventative barrier fabric comprising an oxidized regenerated cellulose fabric which is drapable, conformable, adherent to body organs, and substantially absorbable within thirty (30) days in the body, which fabric has heparin absorbed thereon, said heparin being present in a non-toxic, adhesion-preventative effective amount and potency.

4,840,627

ARTIFICIAL EYE LENS AND METHOD OF TRANSPLANTING SAME

Michael Blumenthal, c/o Abrams, 1136 Fifth Ave., New York, N.Y. 10028

Continuation of Ser. No. 849,325, Apr. 8, 1986, abandoned. This application May 13, 1987, Ser. No. 51,159
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 14 Claims



1. An intraocular lens comprising a hydrogel material and defining:

a central optical portion; and,

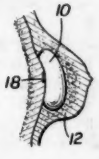
only two oppositely disposed equidistant elongate, fixation elements integrally formed with and extending axially from said optical portion said fixation elements and optical portion defining a straight line, said fixation elements tapering gradually and symmetrically to a minimum along a smooth curve over its length to its outer end, said tapering being normal to the plane of said optical portion thereby substantially eliminating weak points at the interface between the optical portion and the fixation elements.

4,840,628

NON-ENVELOPED GEL PROSTHESIS

Joseph F. Cavon, 1125 E. 17th St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 781,305, Sep. 27, 1985, Pat. No. 4,740,208, which is a continuation of Ser. No. 613,894, May 24, 1984, abandoned, which is a continuation of Ser. No. 209,021, Nov. 21, 1980, Pat. No. 4,470,160. This application Jan. 27, 1988, Ser. No. 148,864
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] A61F *2/12*
U.S. Cl. 623—8 2 Claims



1. An unconstrained cohesive gel prosthesis for implantation in a human body cavity normally substantially occupied by soft tissue consisting essentially of:

an unconstrained molded pressure-dispersing cohesive homogeneous gel elastomer formed to fit the shape and size of a body cavity normally substantially occupied by soft tissue in the human body,

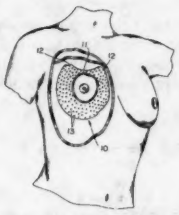
the cohesion of said gel being such that it can be stretched substantially more than 21% of its length without the appearance of stress cracks in the gel, the gel being sufficiently cross linked so that the gel has a non-flowing characteristic.

4,840,629

MAMMARY PROSTHESIS

Ricardo A. Bustos, Sao Paulo, Brazil, assignor to Silimed Silicone E Instrumental Medico-Cirurgico e Hospitalar Ltda., Rio de Janeiro, Brazil

Filed Oct. 11, 1988, Ser. No. 255,278
Claims priority, application Brazil, Oct. 14, 1987, PI8705600
Int. Cl.[4] A61F *2/12*
U.S. Cl. 623—8 8 Claims



1. MAMMARY PROSTHESIS, to be inserted in the breast of a patient by an incision, characterized by comprising a perforated lamina (10) made of an inert and flexible material, having a thickness not exceeding 1.0 mm and showing, when flattened, the approximate shape of an annular sector, with an extension of about 180 to about 220 , the inner diameter and the flexibility of the lamina in the annular sector being sized in order to allow the lamina (10) to assume a substantially frustoconical shape having a slightly convex side surface and the inner peripheral edge surrounding the mammary areola at a certain distance, on inserting the prosthesis between the mammary gland and the detached skin, the ends of the inner peripheral edge of the lamina (10) being close to each other in such a way to occupy one of the positions adjoining and overlapping one another and the extreme edges of the lamina remaining angularly spaced apart.

4,840,630

ARTIFICIAL HIP JOINT

Yasuhiro Kitamura, Kyoto, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 873,288, Jun. 5, 1986, abandoned, which is a continuation of Ser. No. 592,605, Mar. 22, 1984, abandoned. This application Feb. 4, 1988, Ser. No. 154,504
Int. Cl.[4] A01F *2/34*
U.S. Cl. 623—22 3 Claims

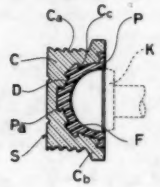
1. An artificial hip joint comprising:

a socket member having a ceramic external frame member to be secured in a hipbone and a cup-shaped, high-density molded polyethylene socket plug held and secured in said external frame member; and

a stem member having a condyle portion at a first end thereof and a second, opposite end thereof designed to be embedded and secured in a thigh bone,

wherein said socket plug rotatably supports a spherical section of said condyle portion, and has a plurality of undercut protrusions,

wherein said external frame member has a generally concave section having a plurality of sockets defined therein, the protrusions of said socket plug being disposed in said sockets, thereby securely joining the socket plug to the external ceramic frame member so as to preclude movement of the socket plug relative to the ceramic frame, the undercut protrusions serving to compensate for the thermal expansion coefficient difference between the socket plug and the external frame member;



said ceramic frame member consisting essentially of a ceramic selected from the group consisting of alumina ceramics, zirconia ceramics and apatite ceramics; and

said condyle portion consisting essentially of monocrystalline alumina ceramics or polycrystalline zirconia ceramics.

4,840,631

ARTIFICIAL HIP JOINT SOCKET WITH HYDRAULIC HEAD SUPPORT

Robert Mathys, Bettlach, Switzerland, assignor to Robert Mathys Co., Bettlach, Switzerland

Continuation-in-part of Ser. No. 864,727, Apr. 23, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 162,249

Claims priority, application Switzerland, Aug. 28, 1984, 04121/84

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—22 **11 Claims**

11. An artificial hip joint socket for receiving and cooperating with a ball head of a femoral prosthetic shaft comprising

a hollow body having a wall and a spherical inner surface for receiving the ball head of the prosthetic shaft such that said ball head and said spherical surface have a common center, said body further including means defining a recess extending into said wall from said inner surface forming a liquid chamber, said recess being positioned at the stress zone of the femoral head support,

said means defining said recess including a circular edge at the line of junction with said spherical inner surface defining the sole opening into said liquid chamber, said edge forming a permanent latitudinal seal with said ball head when said joint is under load so that an increase of pressure of said ball against said spherical surface allows an increase in hydrostatic pressure in said liquid chamber.

4,840,632

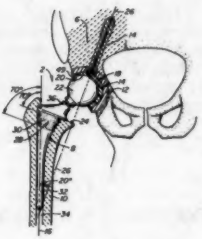
HIP PROSTHESIS

Stanley L. Kampner, 2320 Sutter, San Francisco, Calif. 94115

Continuation of Ser. No. 590,258, Mar. 16, 1984, abandoned. This application May 21, 1986, Ser. No. 870,289

Int. Cl.[4] A61F *2/34, 2/32*

U.S. Cl. 623—22 **40 Claims**



1. An acetabular implant for implantation in an acetabular cavity of a patient comprising a generally semi-spherical acetabular cup including a fixation hole positioned at a location spaced from an edge of the cup so that the hole can be substantially aligned with the pectineal line of the patient when the cup is implanted in the cavity, a portion of an exterior surface of the cup and at least partially spaced from the edge of the cup being porous to promote bone ingrowth upon implantation of the cup, the portion of the exterior cup surface extending over at least a part of the hole, a remainder of the exterior cup surface spaced from the hole and contiguous with at least a portion of the edge of the cup being substantially smooth to inhibit bone ingrowth, and an elongated anchor insertable into the pelvis for mechanically fixing the cup to the pelvis, the anchor including means for engaging the cup and applying a force to the cup in the direction of the anchor to thereby firmly seat the cup in the cavity.

4,840,633

CEMENTLESS ENDOPROSTHESIS

Manfred Kallabis, Falkenweg 24, and Guido Gombert, Schillerstr. 18, both of D-8960 Kempton, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,257

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700102; Jul. 31, 1987, 3725387

Int. Cl.[4] A61F *2/32, 2/30*

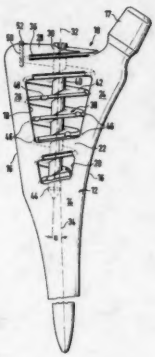
U.S. Cl. 623—23 **12 Claims**

1. A cementless endoprosthesis primarily for hip joints comprising:

a longitudinal stem to be non-rotably inserted into a medullary canal, the stem at a proximal end thereof having a conical neck integral therewith, said neck having a central axis angularly arranged with respect to a central longitudinal axis of the stem, said stem having a pair of broad side faces and a pair of small end faces, the stem including means for guiding and supporting a screw spindle; and

said screw spindle having a broad flange helical flank to engage cancellous bone of the canal, whereby upon being

screwed into the stem in a substantially longitudinal direction, the flange helical flank is extended beyond both side



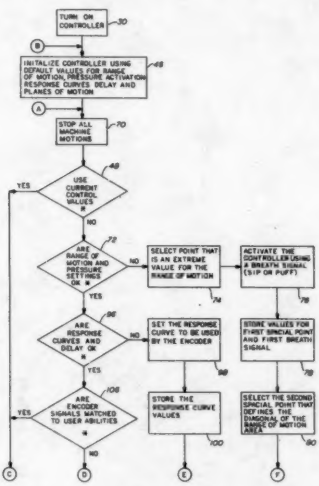
faces of the stem to form a plurality of lateral extending support ribs cutting into cancellous bone of the canal.

4,840,634

CALIBRATION CONTROLLER FOR CONTROLLING ELECTRICALLY OPERATED MACHINES

Walter Muller, Binningen, Switzerland, and Thomas A. Krouskop, Stafford, Tex., assignors to Clayton Foundation for Research, Houston, Tex.

Filed Jun. 10, 1987, Ser. No. 60,563
Int. Cl.[4] B62D *11/04*
U.S. Cl. 623—24 **8 Claims**



1. A controller for enabling a person with limited physical abilities to control one or more electrically operated machines comprising,

a movable mouthpiece adapted to conduct an air flow therethrough in response to a person blowing and/or sipping air therethrough,

a pressure transducer connected to the mouthpiece and actuated by air flow through the mouthpiece, said transducer providing a signal in response to air flow,

a plurality of position transducers connected to and measuring the position of the mouthpiece in a plurality of planes, each transmitter emitting a signal characteristic of the position of the mouthpiece,

a controller connected to and receiving the outputs of the pressure transducer and the position transducers and connected to and controlling one or more machines by control signals,

said controller including calibration means responsive to the outputs of the Pressure transducers and the position transducers selecting one or more planes of motion to be used for control in response to the person and selecting the range of motion in response to the person in each selected plane to be used for control, said calibration means arranging the control signals to fit within the selected planes and range of motion.

4,840,635

FULL-FASHION STUMP SHRINKER FOR THE RESIDUAL LIMB OF A HUMAN AMPUTEE

William B. Smith; Martha M. Field, both of Leawood, Kans.; Lawrence Pierce, Jr., Raytown, Mo., and Jeffrey C. Dalbey, Olathe, Kans., assignors to Knit-Rite, Inc., Kansas City, Mo.

Filed Aug. 8, 1986, Ser. No. 894,651
Int. Cl.[4] A61F *2/80*
U.S. Cl. 623—36 **8 Claims**

1. A stump shrinker for applying comfortable therapeutic compression of at least 10 to 30 millimeters of mercury at 50% stretch of the shrinker to the residual limb of a human amputee comprising:

an elongated, one-piece, soft, pliable fabric receptacle having a pair of flaccid sidewalls initially collapsed flatly against one another prior to donning of the shrinker by the amputee,

said sidewalls being integrally interconnected along their opposite, longitudinal extremities so as to define an internal, stump-receiving socket which changes from a flattened condition before use to a condition conforming to the shape of the stump when the shrinker is worn by the amputee,

said receptacle further having a normally open upper end through which the stump is inserted into the socket when the shrinker is donned by the amputee and a closed, seamless, normally lower toe disposed to engage and bear against the distal end of the stump when the shrinker is in place on the stump,

said receptacle tapering toward a minimum transverse dimension as said toe is approached and being of full-fashion, knit construction whereby to provide said tapered configuration without seams along the longitudinal extremities of the sidewalls,

said fabric being formed by resilient yarn of constant density throughout the shrinker and having such resilience that the shrinker exerts compression of at least 10 to 30 milimeters of mercury at 50% stretch of the fabric,

said yarn being knitted in connected loops of substantially uniform pattern and number per square inch throughout the receptacle, whereby the shrinker exhibits generally uniform compression against the residual limb of the wearer over a wide range of stretch as the limb changes in diameter due to swelling and contraction.

CHEMICAL

4,840,636

MODIFYING THE SURFACE OF THE INTERIOR PORE WALLS OF OBJECTS SUCH AS MEMBRANES WITH GAS ACTIVATED BY PARTIAL BRUSH DISCHARGE

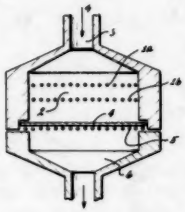
Herbert Bauser; Bernd Schindler, both of Stuttgart, and Horst Chmiel, Leonberg, all of Fed. Rep. of Germany, assignors to Fraunhofer Geselschaft E.V., Munich, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,762

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337763

Int. Cl.[4] B01D *13/04, 39/14;* **C08J** *9/30*

U.S. Cl. 8—115.52 **14 Claims**



1. A method for modifying the surface of the pore walls of a mebrane made of an organic compound material and to be used for separating materials and/or phases of matter comprising the steps of:

providing a flow of gas and forcing said gas through said membrane, said gas comprising or including at least one particular reaction medium, for electro-chemically activating the membrane; and

providing partial electrical brush discharge through said gas, at a point in time prior to the gas having passed through said membrane, for electrically activating said particular reaction medium so that said then activated reaction medium in turn modifies and chemically activates the surface of said pore walls.

4,840,637

SYNTHETIC EBONY AND METHOD OF PRODUCING THE SAME (I)

Philip C. Rolffs, 629 South Shore Dr., P.O. Box 175, Portage, Mich. 49081

Continuation of Ser. No. 933,478, Nov. 21, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 206,190

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[4] D06P *3/60*

U.S. Cl. 8—402 **16 Claims**

1. A method of treating wood of the genus Juglans to change its color completely and throughout the entire structure and substance thereof essentially to jet black, with bronze highlights, consisting essentially of the following steps:

placing the starting wood into a vacuum/pressure vessel

drawing a vacuum in the vessel to below about 50 mm of mercury,

allowing the vessel to stand for a period between about and 24 hours at a temperature between about 100° and 150° F. until essentially all the extractable water and air is extracted from the wood,

introducing an aqueous solution of n iron salt having a concentration between about six (6) and not greater than about eighteen (18) percent by weight into the vessel, while maintaining the vacuum therein,

thereafter applying an elevated pressure inside of the vessel between about 200 and about 800 pounds per square inch,

allowing the vessel to stand for a period between about 3 and about 48 hours at a temperature between about 100° and 250° F. until essentially the maximum possible amount of iron salt solution is absorbed by said wood,

releasing the pressure in the vessel,

draining fluid from the vessel,

removing the wood from the vessel,

washing the wood with water, and

drying the thus-treated wood to produce a jet black synthetic ebony product having bronze highlights.

15. Wood of the genus Juglans characterized by being jet black throughout its entire structure and substance except for bronze highlights, thereby constituting a high-lighted jet-black ebony substitute.

4,840,638

SYNTHETIC EBONY AND METHOD OF PRODUCING THE SAME (II)

Philip C. Rolffs, 629 S. Shore Dr., P.O. Box 175, Portage, Mich. 49081

Continuation of Ser. No. 933,486, Nov. 21, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 206,374

Int. Cl.[4] D06P *3/60*

U.S. Cl. 8—408 **19 Claims**

1. A method of treating wood of the genus Juglans to change its color completely and throughout the entire structure and substance thereof essentially to jet black, consisting essentially of the following stages the steps:

Stage I:

placing the starting wood into a vacuum/pressure vessel,

drawing a vacuum in the vessel to below about 50 mm of mercury,

allowing the vessel to stand for between about 3 and 24 hours at a temperature between about 100° and 150° F. until essentially all the extractable water and air is extracted from the wood,

introducing an aqueous solution of an iron salt having a concentration greater than about twelve (12) percent by weight into the vessel, while maintaining the vacuum therein,

thereafter applying an elevated pressure between about 200 and 800 pounds per square inch inside of the vessel,

allowing the vessel to stand at a temperature between about 100° to about 250° F. for between about 3 and about 48 hours until essentially the maximum possible amount of iron salt solution is absorbed by said wood,

releasing the pressure in the vessel,

draining fluid from the vessel,

removing the wood from the vessel,

washing the wood with water,

drying the thus-treated wood intermediate product having bronze highlights or white iron salt deposits therein, depending upon the amount of tannin naturally present in the wood and the concentration of the iron salt solution employed, and

Stage II:

placing the thus-treated wood intermediate product into a vacuum/pressure vessel,

drawing a vacuum in the vessel to below about 50 mm of mercury,

allowing the vessel to stand for between about 3 and 24 hours at a temperature between about 100° and 150° F. until essentially all the extractable water and air is extracted from the wood,

introducing an aqueous solution of tannic acid having a concentration of at least about four (4) percent by weight into the vessel while maintaining the vacuum therein,

thereafter applying an elevated pressure between about 200 and 800 pounds per square inch inside of the vessel,

allowing the vessel to stand at a temperature between about 100° to about 250° F. for between about 3 and about 48 hours until essentially the maximum possible amount of tannic acid solution is absorbed by said wood,

releasing the pressure in the vessel,

draining fluid from the vessel,

removing the wood from the vessel,

washing the wood with water,

and drying the thus-treated wood to produce a jet black synthetic ebony product essentially free of bronze highlights.

16. The method of treating wood of the genus Juglans to change its color completely and throughout the entire structure and substance thereof essentially to jet black, consisting essentially of the steps of placing the starting Juglans wood into a vacuum/pressure vessel, drawing a vacuum in the vessel and allowing the vessel to stand at an elevated temperature until essentially all of the extractable water and air is extracted from the wood, and impregnating the wood with an aqueous solution of an iron salt at an elevated temperature and pressure to cause blackening of the wood essentially throughout, subjecting the wood to a vacuum at an elevated temperature, until essentially all the extractable water and air is extracted from the wood, and impregnating the wood with an aqueous solution of tannic acid at an elevated temperature and pressure to cause reaction with the iron salt remaining in the thus-treated wood and to complete the blacking process, and drying the thus-treated wood to produce a jet black product.

4,840,639

AGENT FOR DYEING HAIR

Hans Husemeyer, Darmstadt, Fed. Rep. of Germany; Herbert Mager, Fribourg, Switzerland, and Eugen Konrad, Darmstadt, Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 901,994, Aug. 28, 1986, abandoned, which is a continuation of Ser. No. 669,634, Nov. 7, 1984, abandoned, which is a continuation of Ser. No. 433,728, Oct. 12, 1982, abandoned, which is a continuation of Ser. No. 253,636, Mar. 20, 1980, abandoned. This application Jun. 7, 1988, Ser. No. 204,993

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831847

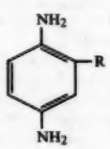
Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—410 **9 Claims**

1. A composition for use in the oxidative dyeing of human hair comprising 0.1 to 5.0 weight percent of a combination of

(A) at least one coupler conventionally used in hair coloring selected from the group consisting of 2-napthol, 3,4-diamino-benzoic acid, resorcinol, 4-chlororesorcinol, m-aminophenol, m-phenylene diamine, n-toluylene diamine, 2,4-diamino anisol, 2,4-diamino benzyl alcohol and 3-amino-6-methylphenol; and

(B) 0.01 to 3.0 weight percent of an 1-hydroxy-alkyl-2,5-diamino-benzene of the formula



where R is a hydroxyalkyl having 1 to 2 carbon atoms as developer.

4,840,640

POLARIZING FILM: POLYMER FILM BASE CONTAINING SUBSTITUTED ANTHRAQUINONE DICHROIC DYE

Konoe Miura, Yokohama; Tetsuo Ozawa, Hadano; Seigo Okumura, Machida, and Hidetoshi Urashima, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

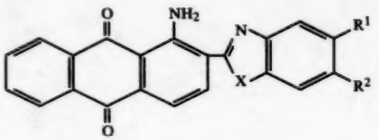
Filed Jun. 16, 1987, Ser. No. 62,881

Claims priority, application Japan, Jun. 17, 1986, 61-140956

Int. Cl.[4] C09B *1/22*; G02B *1/08, 5/30*

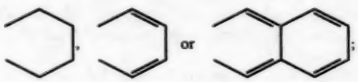
U.S. Cl. 8—506 **6 Claims**

1. A polarizing film which comprises a film base having thereon an anthraquinone dye of general formula (I):



(I)

wherein R^1 and R^2 each represents a hydrogen atom, an alkyl group, an alkoxy group, an aralkyloxy group, an aryl group, a cyclohexyl group, a 4-alkylcyclohexyl group, a carboxylic acid ester group, a carboxylic acid amide group, a halogen atom,



X represents an oxygen atom, a sulfur atom or an amino group.

4,840,641

CATIONIC DIAZACYANINE DYESTUFFS FOR DYEING POLYACRYLONITRILE-WOOL BLENDS

Alfred Brack, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

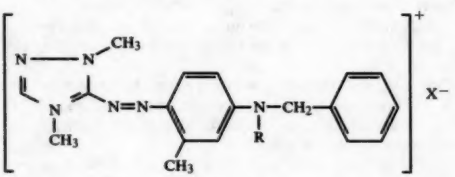
Filed Apr. 4, 1988, Ser. No. 176,904

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712822; Jul. 7, 1987, 3722322

Int. Cl.[4] C09B *44/18, 67/22*

U.S. Cl. 8—534 **5 Claims**

1. A dyestuff of the formula



wherein

R represents methyl or ehtyl and

X^- represents a colorless anion.

4,840,642
MONOAZO COMPOUNDS HAVING A 6-(5'-CHLORO-2',4'-DIFLUOROPYRIMID-6'-YLAMINO)-1-HYDROXY-3-SULFONAPHTHALENE GROUP AND THEIR USE AS DYES

Günther Auerbach, Basel, and Helmut A. Moser, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

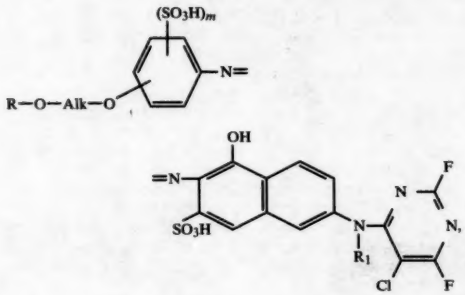
Filed Sep. 4, 1987, Ser. No. 93,335

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630615

Int. Cl.[4] C09B *29/16, 62/24;* D06P *3/32;* C07D *239/42*

U.S. Cl. 8—549 20 Claims

1. A compound of the formula



or a water-soluble salt thereof each cation of which is independently a non-chromophoric cation, wherein Alk is linear or branched C_{2-3}alkylene,

R is hydrogen, sulfo, C_{1-4}alkyl or C_{2-4}hydroxyalkyl,

R_1 is hydrogen, methyl or ethyl, and

m is 0 or 1,

or a mixture of such compounds or salts.

4,840,643
TRICHROMATIC COMBINATION OF DYES FOR NYLON

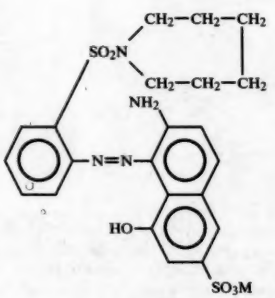
Jay E. Rowe, Douglasville, Pa., assignor to Crompton & Knowles Corporation, Stamford, Conn.

Filed Mar. 16, 1988, Ser. No. 168,657

Int. Cl.[4] C09B *1/00, 29/00, 45/00*

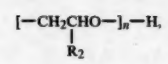
U.S. Cl. 8—641 23 Claims

1. A process for dyeing natural and synthetic polyamide textile fibers by contacting said fibers with an aqueous solution containing a plurality of dyes, in which one of the dyes in said solution is a red acid dye having the structure:

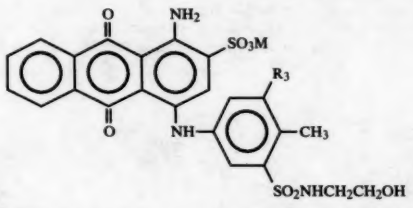


I

Wherein M is —Na, —K, —Li, or —N $(R_1)_4$, R_1 is —H or

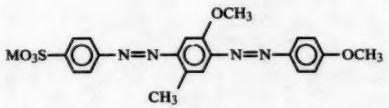


R_2 is —H, —CH_3 or —CH_2CH_3, and n is 1, 2, 3 or 4; and wherein the solution also contains at least one dye selected from a compatible acid blue dye, a compatible acid yellow dye or a mixture of said blue and yellow dyes; said blue dye having the structure:

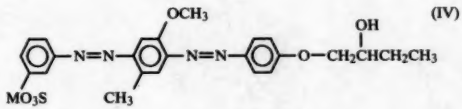


II

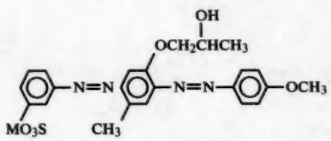
Wherein R_3 is —H or —CH_3 and M has the same meaning as above; and said yellow dye being at least one of the acid yellow dyes having the following structure:



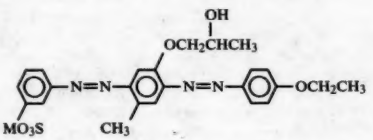
(III)



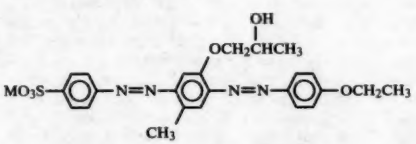
(IV)



(V)



(VI)



(VII)

Wherein M in each of said yellow dye structures has the same meaning as above in Structure I.

4,840,644
CELL CORROSION REDUCTION

Purush Challipoyil, Lincoln; Frank E. Parsen, Weston, and Chih-Chung Wang, Lexington, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 919,412, Nov. 24, 1987, abandoned, Division of Ser. No. 700,836, Feb. 12, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 148,182

Int. Cl.[4] H01M *10/52*

U.S. Cl. 29—623.1 **1 Claim**

1. A method for reducing the gassing of an anode subject to gassing, said method comprising the steps of making single crystal particles of the metal utilized as the active anode of said cell; forming said single crystal particles ino an anode for said cell wherein said anode comprises mercury amalgamated single crystal particles and wherein said mercury is present in said anode in an amount less than about 1.5% by weight thereof; and adding a surface active heteropolar material having a polar affinity to said anode to said cell, wherein said heteropolar material comprises an organic phosphate ester having the formula:

$$[RO(EtO)_n]_x-P(=O)(OM)_y$$

where $x+y=3$

M=H, ammonia, amino, or an alkali or alkaline earth metal and R=phenyl or alkyl or alkylaryl of 6–28 carbon atoms.

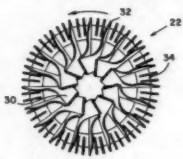
4,840,645
ROTARY SEPARATOR WITH A POROUS SHROUD

Lee R. Woodworth, Calabasas, and Beb H. Rowlett, Palos Verdes, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 15, 1983, Ser. No. 485,156

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—1 **8 Claims**



1. A particle separator for removing particles from an airstream, comprising:

a cylindrical housing having an interior surface, and inlet and an outlet;

a rotor rotatably mounted about an axis within said housing, said rotor having a cylindrical body portion upon which a plurality of rotor blades extending axially along said cylindrical body portion are mounted, said rotor blades extending radially outwardly closely adjacent said interior surface of said housing, said rotor further including an inducer portion near said inlet imparting a dynamic pressure to said airstream as it enters said inlet, said inducer portion also directing said airstream into said rotor blades;

an exducer portion near said outlet, said exducer portion removing a portion of said dynamic pressure from said airstream as it exits said outlet, said interior surface of said housing and said cylindrical body portion defining an annular area through which said airstream is flowed;

means for driving said rotor, the rotation of said rotor causing said airstream within said annular area to swirl around said axis and said particles to migrate radially outward adjacent said interior surface of said housing;

porous shroud means for minimizing secondary flow swirl between said rotor blades, said porous shroud means being mounted onto and rotating with said rotor blades within said housing; and

means for removing said particles adjacent said interior surface of said housing to a location outside said housing.

4,840,646
TETRABROMO BISPHENOL BASED POLYESTERCARBONATE MEMBRANES AND METHOD OF USING

Joginder N. Anand, Clayton, Calif.; Stephen E. Bales, Midland, Mich.; Darrell C. Feay, Orinda, and Thomas O. Jeanes, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 856,878, Apr. 28, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,483

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **36 Claims**

1. A method of separating oxygen from a mixture of gases comprising nitrogen and oxygen wherein the method comprises

a. contacting the gas mixture with a membrane comprising a thin, discriminating layer of polyestercarbonate, wherein the diphenolic residue in the backbone of the polyestercarbonate is a tetrabromo diphenolic residue, under conditions such that the oxygen selectively permeates through the membrane to the other side of the membrane; and

b. removing the permeated gas from the other side of the membrane;

wherein the separation factor for oxygen and nitrogen is 6.5 or greater at about 24° C. and a reduced flux of 1.25×10^{-8} cc/cm^2-sec cmHg or greater oxygen.

19. A membrane comprising a dense skin of a polyestercarbonate, wherein the diphenolic residue in the backbone of the polyestercarbonate is a tetrabromo diphenolic residue, wherein the membrane has a separation factor for oxygen and nitrogen of 6.5 or greater at about 24° C. and a reduced flux of 1.25×10^{-8} cc/cm^2-sec cmHg or greater for oxygen.

4,840,647
PROCESS FOR TREATING A GASEOUS MIXTURE BY ADSORPTION

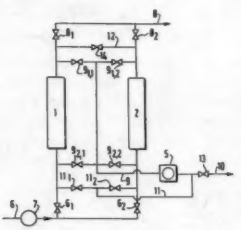
Léon Hay, Paris, France, assignor to L'air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 22,450, Jan. 29, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 267,636

Claims priority, application France, Jul. 4, 1986, 8510405

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **26 Claims**



1. A process for recovering by adsorption at least one preferentially adsorbable constituent of a gaseous feed mixture, said process employing only two adsorbers and comprising the following cycle of operations for each adsorber:

(a) an adsorption stage in which the feed mixture is admitted into a first adsorber through an inlet end thereof and comprising an isobaric adsorption sub-stage at a high

pressure of the cycle for adsorption of said preferentially adsorbable constituent, the mixture, at least during said isobaric sub-stage, circulating through the first adsorber and being withdrawn therefrom through an outlet end thereof, the direction of circulation of the mixture being termed cocurrent, said isobaric sub-stage being conducted until an adsorption front has reached said outlet end;

(b) a first stage for cocurrent decompression of the first absorber to a medium pressure of the cycle;

(c) a second stage for countercurrent decompression of the first adsorber to a low pressure of the cycle, the gas withdrawn in the course of this second stage being the production gas containing the desired content of said adsorbable constituent, at least a portion of the gaseous mixture extracted from the first absorber in the course of stage (b) being richer in said adsorbable constituent than said gaseous feed mixture and being recycled to the inlet end of the second adsorber and admixed with said feed mixture during at least a portion of stage (a) of said second adsorber; and

(d) a recompression stage to raise the pressure in said first adsorber from said low pressure to an initial pressure of said stage (a) by introduction of gas cocurrently withdrawn from the second adsorber.

4,840,648

PROCESS FOR REGENERATING ABSORBENTS CONTAINING CO_2 AND COS

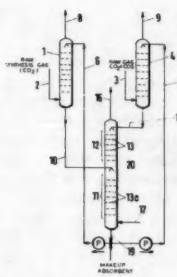
Gerhard Grünewald, Mainz-Gonsenheim, and Manfred Kriebel, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Linde Aktiengesellschaft, Hollriegelskreuth, both of, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,565

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709364

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—44 **4 Claims**



1. A process for regenerating two absorbent solution streams laden with physically dissolved carbon dioxide and carbon oxysulfide, said two absorbent streams coming from two scrubbing zones for scrubbing gases, comprising the steps of:

(a) pressure-relieving a first absorbent solution having carbon dioxide physically dissolved therein, into a first pressure relief zone to effect a pressure reduction of at least two bars and liberate a CO_2-containing gas;

(b) pressure-relieving a second absorbent solution having carbon dioxide and a concentration of carbon oxysulfide at least three times that of the first absorbent solution in a second pressure relief zone containing material-exchange-promoting elements;

(c) passing said CO_2-containing gas liberated in said first pressure relief zone upwards through said second pressure relief zone in counterflow to the second absorbent solution in said second pressure relief zone, whereby a gaseous mixture containing CO_2 and COS is formed in said second pressure relief zone, and said gaseous mixture is withdrawn from the top of said second pressure relief zone; said first pressure relief zone is the lower part of an upright regeneration column and said second pressure relief zone is the upper part of said regeneration column, said second pressure relief zone is disposed directly above the first pressure relief zone and communicates directly therewith, and said second absorbent solution is passed downwardly into and through said first pressure relief zone from said second pressure relief zone, regenerated absorbent solution is withdrawn from the bottom of said regeneration column and two partial streams of said regenerated solution are fed into said two scrubbing zones.

4,840,649

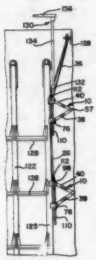
ADJUSTABLE BUTTRESS FOR USE IN AN ELECTROSTATIC PRECIPITATOR

John A. Jonelis, Crystal Lake, and John I. Bata, Algonquin, both of Ill., assignors to Midwest Power Corporation, Rolling Meadows, Ill.

Filed Jul. 19, 1988, Ser. No. 221,345

Int. Cl.[4] B03C *3/04*

U.S. Cl. 55—140 **24 Claims**



1. An adjustable buttress positioned between a portion of an electrostatic precipitator housing and an end plate being on one end of a plurality of plates for spacing the end plate from that portion of the housing comprising, in combination, an axle, a pair of buttress contacts pivotally connected to the axle, said buttress contacts defining a contact plane being substantially parallel to the end plate, each of said buttress contacts being spaced from the axle, and a positioning device connected to the buttress contacts for selectively moving the buttress contacts relative to each other to determine selectively the distance between the axle and the contact plane and thereby determine minimum spacing between the end plate and the portion of the housing.

4,840,650

CEILING FAN FILTER

Elmer L. Matherne, 129 Matherne St., Bourg, La. 70343

Filed Jun. 24, 1988, Ser. No. 211,453

Int. Cl.[4] B01D *46/54*; B63H *1/00*

U.S. Cl. 55—385.1 **13 Claims**

1. A ceiling fan filter comprising:

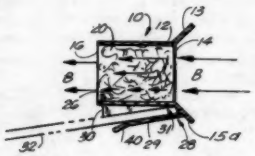
(a) a generally rectangular housing having an air entrance and an air exit;

(b) stop means secured to a perimeter portion of said air entrance and extending across said air entrance;

(c) a filter medium configured to fir within said housing against said stop and intermediate said air entrance and said air exit;

(d) attachment means secured to said housing and adapted to be secured to the leading edge portion of a fan blade for attaching said ceiling fan filter to said fan blade of a ceiling fan, said attachment means comprising portions config-

ured to frictionally fit onto said fan blade, said attachment means portions providing a gap for accepting said leading edge of said fan blade, said gap having generally the same angle as said fan blade has with horizontal plane; and,



(e) elongated channel means secured adjacent said air entrance for channeling air into said air entrance.

4,840,651

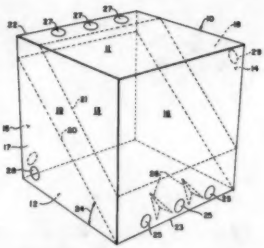
GAS/SOLIDS CONTACTING DEVICE

Donald D. Tiggelbeck, Pittsburgh, Pa., assignor to TIGG Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1988, Ser. No. 142,569

Int. Cl.[4] B01D *45/00*

U.S. Cl. 55—479 **5 Claims**



1. A container for contacting gases with particulate solids comprising a generally rectangular box having a top wall a bottom wall, two side walls and a first end wall and a second end wall opposite the said first end wall, said container including therein a solids-containing chamber formed between a pair of generally parallel foraminous surfaces which are generally perpendicular to said side walls; an upper one of said foraminous surfaces extending from the said top wall adjacent to the intersection of the said top wall with said first end wall to the said second end wall adjacent to the intersection of said bottom wall with said second end wall; a lower one of said foraminous surface extending from said first end wall adjacent to the intersection of said top wall with said first end wall to the region of the intersection of said bottom wall with said second end wall;

at least one solids charging opening communicating with said chamber in the said top wall or said first end wall or either side wall for introducing particulate solids into said solids-containing chamber; at least one solids discharge opening in the said second end wall or bottom wall, said opening communicating with said solids-containing chamber for discharging particulate solids from said solids-containing chamber; at least one gas flow port in said container beneath the said solids-containing chamber to admit gas into or to discharge gas from said container; at least one gas flow port in the said container above the said solids-containing chamber to discharge gas from or to admit gas into said container; said solids-containing chamber containing particulate solids between the said foraminous surfaces and being adapted to permit the flow of gas from a first said gas flow port, through a first of said foraminous surfaces, through the contained particulate solids and through the second of said foraminous surfaces, and through a second said gas flow port; said foraminous surfaces being inclined at an angle greater than the angle of repose of said particulate solids;

said container including a gas distribution means comprising multiple baffles defining multiple gas passageways between said first gas flow port and the said first of said foraminous surfaces, said baffles preventing unidirectional flow of gas from the said first gas flow port to said first of said foraminous surfaces.

4,840,652

METHOD OF GENERATING AND USING COLD, AND DEVICE FOR IMPLEMENTING SUCH METHOD

Laszlo Simon, Satigny, and Jean Pfau, Collonge-Bellerive, both of Switzerland, assignors to Coldeco S.A., Carouge, Switzerland

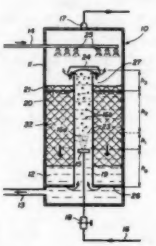
PCT No. PCT/CH87/00008, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04510, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 16, 1987, Ser. No. 110,723

Claims priority, application Switzerland, Jan. 18, 1986, 00178/86; Jan. 18, 1986, 00179/86; Jan. 18, 1986, 00181/86

Int. Cl.[4] B01D *9/04*; C02F *1/22*

U.S. Cl. 62—534 **25 Claims**



1. In a method of generating cold and using it either directly or indirectly after transient storage and restitution, wherein cooling and/or partial freezing of a cold-accumulating and cooling liquid partially filling a cooling cell is effected by injecting a refrigerant at least partly in the liquid state into a mass of said cold accumulating and cooling liquid in said cooling cell, vaporizing said refrigerant directly in said liquid, by collecting the refrigerant in the gaseous state at the upper part of said cooling cell, above a free surface of the cold-accumulating and cooling liquid, wherein the cold-accumulating and cooling liquid is withdrawn from said cell, and is conveyed in a cold-utilization circuit and/or at least one cold-storage cell, then is reintroduced into said cooling cell, the improvement wherein a stream of liquid in closed hydraulic circuit is generated in said cooling cell during injection of said refrigerant, said stream including at least one ascending stream of cold-accumulating and cooling liquid, located substantially above a zone of injection of said refrigerant at least partly in the liquid state, said zone of injection being located on a portion of a horizontal section of said cell, said stream further including at least one descending stream formed essentially of cold-accumulating and cooling liquid free of said gaseous refrigerant, wherein said stream in closed hydraulic circuit is produced by a siphon effect induced by reduction of the mean density of the mixture of liquid and bubbles of vaporized refrigerant above said injection zone, and wherein the rate of injection of said refrigerant is adjusted in such manner that vaporization thereof generates a gel or a fluid and homogeneous suspension of crystals of cold-accumulating and cooling liquid frozen in the bulk of said liquid in movement.

4,840,653

FABRICATION OF HIGH-SILICA GLASS ARTICLE

Eliezer M. Rabinovich, Berkeley Heights, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 17,905, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 774,666, Sep. 11, 1985, abandoned, which is a continuation of Ser. No. 743,268, Jun. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 564,181, Dec. 22, 1983, abandoned. This application Sep. 19, 1988, Ser. No. 246,954

Int. Cl.[4] C03B *37/016*

U.S. Cl. 65—3.12 6 Claims

1. A method for fabricating an article comprising silica-containing glass, the method comprising the steps of:

dispersing silica-containing material in a polar liquid to form a sol;

gelling said sol to form a gel body;

treating said gel body with heat to form a silica-containing glass body; and

completing the fabrication of said article, Characterized In That

said silica-containing material includes at least a first portion containing chemically bound fluorine and a second portion which is essentially free of chemically bound fluorine, the duration of said gelling step ranging from about 5 minutes to about 24 hours.

4,840,654

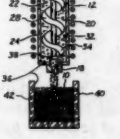
METHOD FOR MAKING MULTI-LAYER AND PIN GRID ARRAYS

Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 811,906, Dec. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 707,636, Mar. 4, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 147,596

Int. Cl.[4] C03B *19/09*

U.S. Cl. 65—18.1 21 Claims



1. The process of forming a structure from a ceramic and glass composite, said process comprising the steps of:

providing particles of ceramic material;

providing particles of glass material;

mixing said particles of glass and ceramic together to form a mixture of ceramic and glass particles;

heating said mixture to a temperature from about 500° to about 700° C. to form a slurry of solid ceramic particles in a matrix of molten glass;

pressing said slurry at a pressure of less than about 15 psi into a mold having the shape of said desired structure;

forming the slurry into said structure; and

cooling said structure to solidify the molten glass.

4,840,655

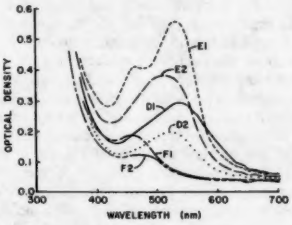
METHOD FOR MAKING COLORED PHOTOCHROMIC GLASSES

Nicholas F. Borrelli, Elmira, and Brent M. Wedding, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 26, 1988, Ser. No. 161,093

Int. Cl.[4] C03C *4/06*

U.S. Cl. 65—30.11 3 Claims



1. A method for optically bleaching a surface-colored photochromic glass article which comprises the steps of:

selecting for treatment a surface-colored silver halide-containing photochromic glass;

heating the surface colored photochromic glass to an elevated temperature of at least about 200° C.; and

exposing the surface colored photochromic glass to short wavelength light of an energy of at least about 3 electron volts while at the elevated temperature; said exposure being for a time at least sufficient to irreversibly bleach the undarkened color of the surface-colored photochromic glass.

4,840,656

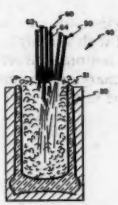
METHODS AND APPARATUS FOR FORMING GLASS ARTICLES

Michael J. Ziegler, Parma; Barry Millward, Chagrin Falls, and Kenneth P. Robb, Jr., Stow, all of Ohio, assignors to AGA A.B., Lidingö, Sweden

Continuation of Ser. No. 70,403, Jul. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 945,285, Dec. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,614, Nov. 15, 1985, Pat. No. 4,652,292, which is a continuation-in-part of Ser. No. 600,410, Apr. 16, 1984, Pat. No. 4,553,999. This application Oct. 17, 1988, Ser. No. 259,465

Int. Cl.[4] C03B *9/36*

U.S. Cl. 65—85 15 Claims



1. In a method of making a hollow glass article by shaping a quantity of molten glass in a mold cavity, the improvement comprising the steps of:

(a) placing a gob of molten glass in a mold cavity that defines features of the shape of the article that is to be formed;

(b) pressure forming a glass article by pressing a mold core within the mold cavity against the molten glass gob and

pressure forcing the molten glass to flow in a space between the mold core and mold cavity into a desired shape;
(c) removing the mold core from a hollow of the newly formed glass article;
(d) providing a source of pressurized cryogen which has a temperature substantially below that of ambient air;
(e) providing a source of pressurized air; and,
(f) introducing cryogen and air from the pressurized sources thereof through injector means for introducing flows of these flows into the hollow interior of the newly formed glass article to cool the newly formed glass article and to give the article shape stability so the newly formed glass article can be removed from the mold cavity.

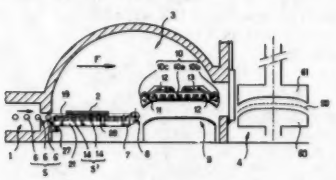
15. In a hollow glass article manufacturing machine including a mold having a cavity into which a quantity of molten glass is introduced to be conformed to a desired shape as defined by the mold cavity, and having gas inlet means for admitting a flow of cooling gas to the mold cavity interiorally with respect to the hollow glass article being formed in the cavity to directly cool interior surface portions of the molten glass therein for at least assisting in conforming a quantity of molten glass to a desired configuration defined by the mold cavity, the improvement of means for providing separate flows of cold cryogen vapor and air into the hollow glass article wherein the flows are mixed to provide a cooling gas that has a temperature that is substantially below the temperature of ambient air, and wherein the gas inlet means includes:
(a) tube-within-a-tube cryogen injector means for separately discharging relatively low and relatively high velocity flows of cryogen vapor in directions generally toward the hollow interior of a newly formed pressed glass article;
(b) auxiliary injector means for discharging a flow of ambient air in a direction toward the hollow interior of a newly formed pressed glass article; and,
(c) the cryogen and air injector means being arranged to direct flows of cryogen vapor and air into the hollow interior of a newly formed pressed glass article for mixing in the hollow interior to provide said cooling gas.

4,840,657

PROCESS AND APPARATUS FOR BENDING GLASS PLATES

Roger Orain, Garches, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 8, 1988, Ser. No. 216,389
Claims priority, application France, Jul. 15, 1987, 87 09916
Int. Cl.[4] C03B *23/025*
U.S. Cl. 65—107 **33 Claims**



1. A process for bending glass plates brought to high temperature and arriving flat on a conveyor, said process comprising the steps of:
(a) grasping each glass plate by its lower face; then
(b) turning each plate over to bring its lower face into upper position; and then
(c) depositing each plate on a bending form the profile of which it assumes.

20. Apparatus for bending glass plates brought to high temperature and arriving flat on a conveyor, said apparatus comprising:
(a) a bending cell;
(b) a plate located in said bending cell and able to receive the glass plates from the conveyor that brings them, said plate being equipped with means for holding the glass plates by a partial vacuum and being able to pivot to turn over the held glass plates to bring the initially lower faces of these plates into the upper position; and
(c) a bending form located under said plate after it has pivoted so that, when said plate releases each glass plate, the glass plate is deposited on said bending form.

4,840,658

ALGICIDAL COMPOSITION

Hiroshi Kakisawa; Takenori Kusumi, both of Ibaraki, and Nobuo Ohno, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,694
Claims priority, application Japan, Mar. 14, 1986, 61-57925
Int. Cl.[4] A01N *37/06*
U.S. Cl. 71—67 **6 Claims**

1. An algicidal composition which comprises as an active ingredient an algicidally effective amount of a higher fatty acid containing 16 to 22 carbon atoms having 4-5 carbon-carbon unsaturated bonds in molecule or its environmentally acceptable salt, and an inert carrier.

4. A method of controlling algae which comprises applying an algicidally effective amount of a higher fatty acid or its salt as claimed in claim 1 to algae selected from the group consisting of *Chattonella antiqua, Chattonella marina, Olisthodiscus luteus, Heterosigma akashiwo, Gymnodinium nagasakiense, Gymnodinium sanguineum* and *Gymnodinium breve.*

4,840,659

N-PHOSPHONOMETHYLGLYCINE PHYTOTOXICANT COMPOSITIONS

John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 511,695, Jul. 7, 1983, abandoned, which is a division of Ser. No. 361,219, Mar. 24, 1982, Pat. No. 4,495,363, which is a continuation of Ser. No. 630,392, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 362,712, May 22, 1973, abandoned, which is a division of Ser. No. 170,385, Aug. 9, 1971, Pat. No. 3,799,758, which is a continuation-in-part of Ser. No. 123,057, Mar. 10, 1971, abandoned. This application Mar. 16, 1988, Ser. No. 168,797
The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.[4] A01N *57/04*
U.S. Cl. 71—86 **4 Claims**

1. A phytotoxicant composition adapted for use as a herbicide comprising a herbicidally effective amount of N-phosphonomethylglycine, a diluent, and a surface active agent.

4,840,660

PLANT GROWTH REGULATOR DISPERSIONS

William J. Kowite, and Stephen L. Oestreicher, both of Raleigh, N.C., assignors to Rhone Poulenc Nederlands B.V., Amstelveen, Netherlands

Continuation of Ser. No. 814,898, Dec. 30, 1985, abandoned. This application Nov. 19, 1987, Ser. No. 122,626
Int. Cl.[4] A01N *57/12*
U.S. Cl. 71—86 **16 Claims**

1. A stable plant growth regulating composition which comprises a dispersion, having a Brookfield viscosity of less than 800 cps, said dispersion being a microemulsion, and containing micelles no larger than 300 nm in diameter, of:
a. from about ten percent (10%) to about fifty percent (50%) by weight of 2-chloroethylphosphonic acid; and
b. from about twenty percent (20%) to about sixty percent (60%) by weight of a hydrocarbon oil which is:
i. substantially immiscible with water;
ii. stable at the pH of said regulator compound, said pH being as low as 0.5 pH; and

iii. said hydrocarbon oil forming a continuous phase of said microemulsion; and

c. from about five percent (5%) to about twenty-five percent (25%) by weight water; and

d. from about ten percent (10%) to about forty percent (40%) by weight of hydrophobic surfactant selected from the group consisting of phosphate acid, phosphate esters, or one or more anionic or nonionic polyethoxylated alcohol or phenol compounds containing from about eight to about twenty carbon atoms in the alkyl chain and less than twenty moles of ethylene oxide per mole of alcohol or phenol, said surfactant having an HLB less than about8, or surfactant mixture which is stable at said pH of said regulator compound.

4,840,661

SULPHONYLISO(THIO)UREA DERIVATIVES AND HERBICIDAL USE THEREOF

Hans-Joachim Diehr; Christa Fest, both of Wuppertal; Rolf Kristen, Monheim; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Wolfgang Roy, Langenfeld; Hans-Joachim Santel, Cologne; Robert R. Schmidt, Bergisch Gladbach, and Ludwig Eue, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

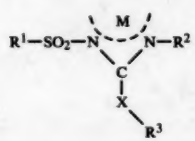
Filed Aug. 23, 1985, Ser. No. 769,272

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431921; May 17, 1985, 3517844

Int. Cl.[4] A01N *43/02, 43/48;* **C07D** *401/00, 403/00*

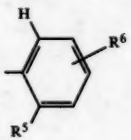
U.S. Cl. 71—90 **8 Claims**

1. A sulphonyliso(thio)urea derivative of the formula



in which

R^1 represents the radical



wherein

R^5 and R^6 are identical or different and represent hydrogen, halogen, cyano, nitro, C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylaminocarbonyl, di-(C_1–C_4-alkyl)-amino-carbonyl, hydroxyl, C_1–C_4-alkoxy, formyloxy, C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkoxy-carbonyloxy, C_1–C_4-alkylamino-carbonyloxy, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, di-(C_1–C_4-alkyl)-aminosulphonyl, C_3–C_6-cycloalkyl or phenyl), or represent C_2–C_6-alkenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_2–C_6-alkinyl (which is optionally substituted by fluorine, chlorine bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_1–C_4-alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–Ch_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), or represent C_1–C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), or represent C_3–C_6-alkenyloxy (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl), or represent C_2–C_6-alkenylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_3-alkylthio or C_1–C_4-alkoxy-carbonyl), C_3–C_6-alkinyloxy, C_3–C_6-alkinylthio, or represent the radical $—S(O)_p—R^7$

wherein

p represents the numbers 1 or 2 and

R^7 represents C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl), C_3–C_6-alkenyl, C_3–C_6-alkinyl, C_1–C_4-alkoxy, C_1–C_4-alkoxyamino, C_1–C_4-alkoxy-C_1–C_4-alkyl-amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino, or

R^5 and R^6 furthermore represent phenyl or phenoxy, or represent C_1–C_4-alkylcarbonylamino. C_1–C_4-alkoxy-carbonylamino, C_1–C_4-alkylamino-carbonylamino or di-(C_1–C_4-alkyl)-amino-carboxylamino, or represent the radical $—CO—R^8$,

wherein

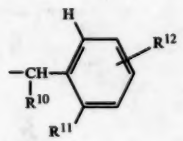
R^8 represents C_1–C_6-alkyl, C_1–C_6-alkoxy, C_3–C_6-cycloalkoxy, C_3–C_6-alkenyloxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, C_1–C_4-alkoxyamino, C_1–C_4-alkoxy-C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino (which are optionally substituted by fluorine and/or chlorine), or R^5 and R^6 furthermore represent C_1–C_4-alkylsulphonyloxy, di-(C_1–C_4-alkyl)aminosulphonylamino or the radical $—CH=N—R^9$,

wherein

R^9 represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1–C_4-alkoxy, carbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, or represents benzyl which is optionally substituted by fluorine or chlorine, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, optionally substituted by fluorine or chlorine, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or represents C_1–C_6-alkoxy, C_3–C_6-alkenoxy, C_3–C_6-alkinoxy or benzyloxy, optionally substituted by fluorine and/or chlorine, or represents amino, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)amino, phenylamino, C_1–C_4-alkyl-carbonyl-amino, C_1–C_4-alkoxy-carbonylamino or C_1–C_4-alkylsulphonylamino, or represents phenylsulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methyl;

or wherein, furthermore,

R^1 represents the radical



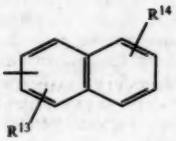
wherein

R^{10} represents hydrogen or C_1–C_4-alkyl and

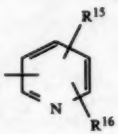
R^{11} and R^{12} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylsulphonyl or di-(C_1–C_4-alkyl)-aminosulphonyl;

or wherein, furthermore,

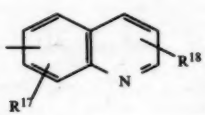
R^1 represents the radical



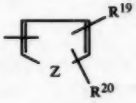
wherein
R^{13} and R^{14} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine);
or wherein, furthermore,
R^1 represents the radical



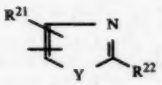
wherein
R^{15} and R^{16} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represent C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), or represent di-(C_1–C_4-alkyl)-aminosulphonyl or C_1–C_4-alkoxycarbonyl;
or wherein, furthermore,
R^1 represents the radical



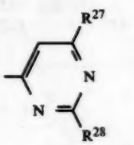
wherein
R^{17} and R^{18} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or bromine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represent C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), or represent di-(C_1–C_4-alkyl)-aminosulphonyl;
or wherein, furthermore,
R^1 represents the radical



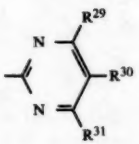
wherein
R^{19} and R^{20} are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), di-(C_1–C_4-alkyl)-amino-sulphonyl or C_1–C_4-alkoxy-carbonyl and
Z represents oxygen, sulphur or the grouping N—Z^1,
wherein
Z^1 represents hydrogen, C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C_3–C_6-cycloalkyl, benzyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine or nitro), C_1–C_4-alkyl-carbonyl, C_1–C_4-alkoxy-carbonyl or di-(C_1–C_4-alkyl)-aminocarbonyl;
or wherein, furthermore,
R^1 represents the radical



wherein
R^{21} represents hydrogen, C_1–C_5-alkyl or halogen
R^{22} represents hydrogen or C_1–C_5-alkyl and
Y represents sulphur or the grouping N—R^{23}
wherein
R^{23} represents hydrogen or C_1–C_5-alkyl;
and wherein, furthermore,
R^2 represents the radical



wherein
R^{27} and R^{28} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino, with the proviso that at least one of the radicals R^{27} and R^{28} is other than hydrogen;
or wherein, furthermore,
R^2 represents the radical

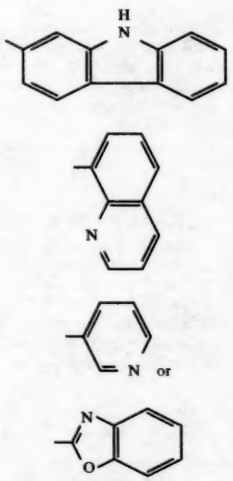


wherein
R^{29} represents hydrogen, fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine),
R^{30} represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), cyano, formyl, C_1–C_4-alkyl-carbonyl or C_1–C_4-alkoxycarbonyl and
R^{31} represents hydrogen, fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), amino, C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino, or
R^{30} and R^{31} together represent C_3–C_4-alkanediyl;
or wherein, furthermore,
R^3 represents a phenyl radical, which is optionally substi-

tuted by one or more of the radicals from the series comprising halogen, cyano, nitro, hydroxyl, carboxyl, C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, nitro, cyano, hydroxyl, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or phenyl), C_3–C_6-cycloalkyl C_1–C_4-alkoxy (which is optionally substituted by flourine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_4-alkoxy-carbonyl), C_1–C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, byano, carboxyl or C_1–C_4-alkoxy-carbonyl), amino, C_1–C_4-alkylamino and di-(C_1–C_4-alkyl)-amino (which are optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl), C_1–C_4-alkyl-carbonyl-amino, C_1–C_4-alkoxy-carbonyl-amino, (di)-C_1–C_4-alkylaminocarbonyl-amino, formyl, C_1–C_4-alkyl-carbonyl, benzoyl, C_1–C_4-alkoxy-carbonyl, phenoxy-carbonyl, benzyloxycarbonyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, hydroxyl or methyl), phenoxy, phenylthio, phenylsulphonyl, phenylamino and phenylazo (which are optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl), pyridoxy and pyrimidoxy (which are optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl), C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkyl-amino-carbonyloxy and di-(C_1–C_4-alkyl)-amino-carbonyloxy, or which is optionally fused with an alkylene chain (which is optionally branched and/or interrupted by one or more oxygen atoms) or a benzo radical (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl);

or wherein, furthermore,

R^3 represents a



which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_3-alkyl or C_1–C_3-alkoxy (the latter optionally being substituted by fluorine and/or chlorine);

and wherein, furthermore,

X represents oxygen or sulphur and

M represents hydrogen or one equivalent of sodium, potassium, magnesium, calcium, aluminium, manganese, iron, cobalt or nickel,

or an adduct thereof with a strong acid.

5. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound or adduct thereof according to claim 1.

4,840,662

N-(2-NITROPHENYL)-5-AMINOPYRIMIDINE DERIVATIVES AND USEFUL FOR CONTROLLING HARMFUL MICRO-ORGANISMS

Helmut Zondler, Bottmingen; Adolf Hubele, Magden, and Robert Nyfeler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

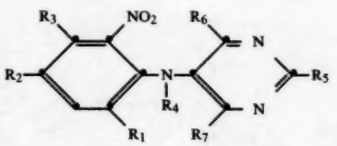
Filed Jul. 16, 1984, Ser. No. 631,272

Claims priority, application Switzerland, Jul. 25, 1983, 4047/83

Int. Cl.[4] A01N *25/32;* **C07D** *239/34, 407/04*

U.S. Cl. 71—92 **11 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are each independently NO_2 or CF_3, or one of R_1 and R_2 is hydrogen,

R_3 is hydrogen or halogen,

R_4 is hydrogen or the —C(O)R' group, in which R' is C_1–C_4alkyl which is unsubstituted or substituted by one halogen, C_1–C_3alkoxy or C_1–C_3alkylthio,

R_5, R_6 and R_7 are each independently hydrogen, halogen, nitro, cyano, thiocyano, mercapto, C_1–C_6alkyl, C_1–C_6haloalkyl, C_1–C_6alkoxy, C_1–C_6alkoxy which is substituted by one halogen, nitro, cyano, C_1–C_3alkoxy, C_1–C_3alkylthio and/or $N(C_1$–$C_4alkyl)_2$; or are C_3–C_6cycloalkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy, C_1–C_6alkylthio, C_3–C_6alkenylthio, C_1–C_6alkylsulfonyl, C_1–C_6alkylsulfoxyl, C_3–C_6alkenyl, C_3–C_6haloalkenyl, C_3–C_6alkynyl, C_3–C_6haloalkynyl or the $N(C_1$–$C_4alkyl)_2$ group, and R_5 may additionally be a phenyl or benzyl group which are both unsubstituted or substituted by one to three identical or different members selected from halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_3haloalkyl, $N-(C_1$–$C_3alkyl)_2$, and/or C_1–C_3alkoxy.

11. A method of controlling phytopathogenic pests or of preventing cultivated plants from being attacked by such pests, which comprises applying to said plants or to the locus thereof an effective amount of a compound of claim 1.

4,840,663

SYNERGISTIC COMPOSITION AND METHOD FOR SELECTIVE WEED CONTROL IN RICE

Marco Quadranti, Brugg; Wilheim Schmidli, Münchwilen, and Andreas Zoschke, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1987, Ser. No. 107,202

Claims priority, application Switzerland, Oct. 22, 1986, 4216/86

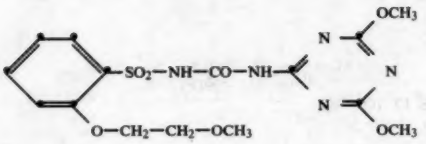
Int. Cl.[4] A01N *43/66*

U.S. Cl. 71—93 **8 Claims**

1. A synergistic composition for selective weed control in rice, characterized in that, in addition to carriers and/or other adjuvants, it contains, in admixture with one another, as active component, on the one hand

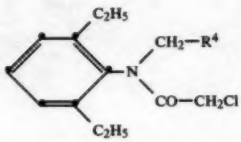
N-[2-(2-methoxyethoxy)-phenylsulphonyl]-N' (4,6-dimethoxy-1,3,5-triazin-2-yl)-urea of the formula I

(I)



and an active ingredient of formula

(V)



in which R^4 represents C_4–C_4 alkoxy or C_1–C_4 alkoxymethyl.

4,840,664

HERBICIDAL PYRIDINE DERIVATIVES

David Cartwright, Reading, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Feb. 22, 1979, Ser. No. 14,252

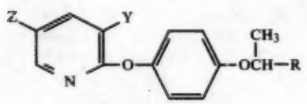
Claims priority, application United Kingdom, Mar. 1, 1978, 8127

Int. Cl.[4] A01N *43/40;* **C07D** *213/64*

U.S. Cl. 71—94 **10 Claims**

1. A herbicidal pyridine compound of the formula (II)

(II)



wherein Z is a trifluoromethyl, difluoromethyl, or chlorodifluoromethyl radical or hydrogen; Y is hydrogen, chlorine or a trifluoromethyl radical, provided that at least one of Z and Y is a halogenomethyl radical; and R is a carboxyl group; a lower alkoxycarbonyl group wherein the alkoxy group may be straight or branched, and which is unsubstituted or substituted with one or more hydroxy, alkoxy, or halogen substituents; or, in the case of compounds wherein R is a carboxyl group, a salt thereof; and wherein more than 50% by weight of the compound is in the form of the D optical isomer.

10. A method of controlling unwanted graminaceous weeds which comprises applying to said weeds a herbicidally effective amount of a compound according to claim 1 wherein more than 50% by weight of the compound is in the form of the D optical isomer.

4,840,665

WEAR-RESISTANT SINTERED IRON-BASED ALLOY AND PROCESS FOR PRODUCING THE SAME

Satoshi Fujii, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 14, 1987, Ser. No. 3,342

Claims priority, application Japan, Jan. 14, 1986, 61-6934

Int. Cl.[4] C22C *29/02*

U.S. Cl. 75—241 **2 Claims**

1. A wear-resistant sintered iron-based alloy consisting essentially of

a first phase having a martensite composition which comprises from 0.5 to 3.0 wt % of Cr, from 0.4 to 1.0 wt % of Mn, from 0.1 to 0.4 wt % of Mo, and the balance of Fe, based on the total amount of said first phase;

a second phase having a martensite and Cr carbide composition which comprises from 10 to 20 wt % of Cr and the balance of Fe, based on the total amount of said second phase; and

from 1.0 to 2.5 wt % of C, based on the total amount of said alloy;

wherein said first phase and said second phase are present as a mixture containing from 10 to 80% by volume of said second phase, based on the total volume of said alloy; and said alloy is substantially free from any residual austenite.

4,840,666

LACQUER, AND PROCESS FOR PRODUCING ANTI-CORROSION COATINGS

Helmut Schmidt, Höchberg; Helmut Patzelt, Kist; Gerhard Tünker, and Horst Scholze, both of Würzburg, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 792,840, Oct. 30, 1985. This application Apr. 18, 1988, Ser. No. 185,268

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 3439880

Int. Cl.[4] C04B *9/02*

U.S. Cl. 106—14.05 **13 Claims**

1. An anti-corrosion lacquer containing:

(1) a silicic acid heteropolycondensate prepared by hydrolyzing and polycondensing:

(a) at least one organosilane of the formula I:

$$R_mSiX_{4-m} \quad (I)$$

wherein R is alkyl, alkenyl, aryl, aralkyl, alkylaryl, arylalkenyl or alkenylaryl, X is hydrogen, halogen, hydroxyl, alkoxyl, acyloxy or the group $-NR'_2$, wherein R' is hydrogen or alkyl, with each being the same or different, and m is 1, 2 or 3, and at least one of the following components (b), (c) and (d):

(b) one or more silicon-functional silanes of the formula II:

$$SiX_4 \quad (II)$$

wherein X has the above meaning, with the proviso that not all of the radicals X are hydrogen,

(c) one or more oxides, which have low volatility and are soluble in the reaction medium, of an element of main groups Ia to Va or of subgroups IIb to Vb of the periodic table or one or more compounds, which form such an oxide of low volatility, of these elements, and

(d) one or more organo-functional silanes of the formula III:

$$R_n(R''Y)_pSiX_{(4-n-p)} \quad (III)$$

wherein R and X have the above meaning, R'' is alkylene, arylene, alkylenearylene, alkenylene or alkylenearylene, wherein said R'' radicals are uninterrupted or interrupted by oxygen or sulfur atoms or —NH— groups, Y is halogen or an amino, amide, aldehyde, alkylcarbonyl, carboxyl, hydroxyl, mercapto, cyano, alkoxy, alkoxycarbonyl, sulfonic acid, phosphoric acid, acryloxy, methacryloxy, glycidyloxy, epoxy or vinyl group, n is 0, 1 or 2 and p is 1, 2 or 3, with n+p being 1, 2 or 3, wherein the total proportion of components (b), (c) or (d) or (b), (c) and (d) is at least 5 mole percent,

(2) a filler in flake or lamellar form, and

(3) an organic solvent capable of dissolving said silicic acid heteropolycondensate.

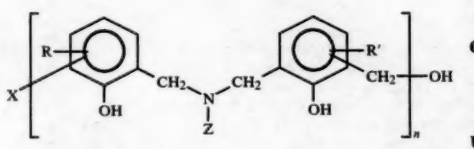
4,840,667

METAL-CHELATING DIPHENOLAMINE OLIGOMERS FOR CORROSION INHIBITION OF METAL SUBSTRATES

Walter O. Siegl, Dearborn, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 20, 1987, Ser. No. 5,182
Int. Cl.[4] C04B 9/02; C23C 22/48
U.S. Cl. 106—14.15 11 Claims

1. An aqueous composition useful to deposit a corrosion inhibiting coating on a corrodible metal substrate said composition (1) having a pH of between about 2 and about 10 and (2) comprising at least about 0.01 weight percent of a water-soluble or water-dispersible diphenolamine oligomeric metal-chelating compound selected from compounds having the general chemical formula:



wherein each R and R' is independently selected from alkyl, alkoxy, aryl and halogen, X is hydrogen, CH_2OH or a methylene bridging group, Z is alkyl, aryl or hydroxy alkyl, X and R are each attached at the ortho or para position on its phenol ring and R' and said methylene bridging group are each attached at the ortho or para position on its phenol ring, and n is between about 2 and about 150.

4,840,668

CORROSION-INHIBITING PIGMENTS, THEIR PRODUCTION AND USE

Manfred Gawol, Clausthal-Zellerfeld, and Gerhard Adrian, Goslar, both of Fed. Rep. of Germany, assignors to Dr. Hans Heubach GmbH & Co. KG, Langelsheim, Fed. Rep. of Germany

PCT No. PCT/EP87/00071, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/05040, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 13, 1987, Ser. No. 116,723
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605526
Int. Cl.[4] C09D 5/08; C04B 14/34; C09C 1/00
U.S. Cl. 106—14.21 11 Claims

1. A corrosion inhibiting pigment for paints and varnishes compatible with galvanized steel substrates, nongalvanized steel substrates as well as aluminum substrates, said pigment consisting essentially of:

a first component selected from the group consisting of metallic oxides, metallic phosphates, metallic molybdates and mixtures thereof, wherein the metal is at least one member selected from the group consisting of zinc, aluminum, iron, barium, strontium, calcium, magnesium and titanium; and

soluble chromate in an amount equivalent to 0.03–0.6 weight percent sodium dichromate based on the total weight of the pigment, said soluble chromate being in the form of a compound selected from the group consisting of sodium dichromate, potassium dichromate, ammonium dichromate, sodium chromate, potassium chromate, ammonium chromate, potassium chromate, chromic acid and mixtures thereof, said pigment being compatible with galvanized steel substrates, non-galvanized steel substrates as well as aluminum substrates.

4,840,669

WATER SOLUBLE COLORING COMPOSITIONS CONTAINING SPARKLE COMPONENTS

Cleveland L. Hughes, Grand Terrace; Timothy N. Williams, Canoga Park, and Paul M. Mandel, Jr., Orange, all of Calif., assignors to Color Quest Inc., Anaheim, Calif.

Filed Mar. 16, 1987, Ser. No. 25,853
Int. Cl.[4] C09D 13/00
U.S. Cl. 106—19 6 Claims

1. A water soluble crayon composition, consisting of: a polymeric thickener to maintain solid components in a uniform and permanent suspension in the composition; water soluble micro-crystalline wax to thicken the composition; color and glitter, the composition being porable at about 95° F.–130° F., and formulated in the temperature range of about 90° F.–130° F.

4,840,670

WATER SOLUBLE COLORING COMPOSITIONS CONTAINING SPARKLE COMPONENTS

Cleveland L. Hughes, Grand Terrace; Timothy N. Williams, Canoga Park, and Paul M. Mandel, Jr., Orange, all of Calif., assignors to Color Quest Inc., Anaheim, Calif.

Filed Mar. 16, 1987, Ser. No. 25,854
Int. Cl.[4] C09D 11/00
U.S. Cl. 106—19 3 Claims

1. A water soluble paint composition including poster paints, color brushes, and roller balls consisting of: water; a polymeric thickener to maintain solid components in a uniform and permanent suspension in the composition, selected from the group consisting of a polyacrylic acid, nitrile latexes, styrene-butadiene latexes, polyisobutylene, acrylic latexes, rosin gum, flours, starches, fumed silica, hydroxypropyl methyl cellulose, hydroxy butyl methyl cellulose; glycerin, or alcohols selected from the group consisting of sorbitol, cetyl, and mixtures thereof in liquid form to enable the mixture to flow at about 85° F.–130° F.; a water soluble microcrystalline wax to thicken the composition; and, glitter and coloring agents.

4,840,671

PROCESS FOR CHEMICAL STABILIZATION OF HEAVY METAL BEARING DUSTS AND SLUDGES AS EAF DUST

John D. Lynn, Center Valley; Charles E. Jablonski, and Walter D. Egan, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 63,605, Jun. 18, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 227,438
Int. Cl.[4] C04B 13/34, 7/147, 7/00
U.S. Cl. 106—85 10 Claims

1. A method of chemically stabilizing waste material selected from the group consisting of electric arc furnace dust, lime kiln dust and fly ash, where such material contains heavy metals and may be classified as hazardous waste, comprising the steps of

(1) mixing said waste material with an effective amount of lime, waste pickle liquor and water to yield a flowable blend,

(2) allowing said blend to set to produce a relatively impermeable concrete-like solid waste in which said heavy metals are physically entrapped or adsorbed therein.

4,840,672

LIGHTWEIGHT INSULATING BOARDS AND PROCESS FOR MANUFACTURING SAME

Emile Baes, Kapelle-op-den-Bos, Belgium, assignor to Redco N.V., Belgium

Filed Mar. 12, 1987, Ser. No. 25,195
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608544
Int. Cl.[4] C08K 3/34, 3/10
U.S. Cl. 106—86 11 Claims

1. Lightweight insulating board comprising:

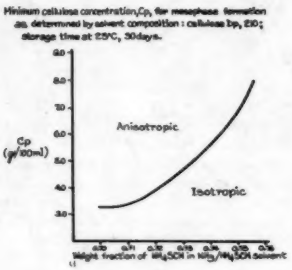
(a) 50–70% by weight of cement,
(b) 0–5% by weight of cellulose fibers,
(c) 0.5–4% by weight of non-cellulose, alkali-resistant fiber material,
(d) 5–20% by weight of mica,
(e) 5–20% by weight of light filler and
(f) 8–25% by weight of hydrated lime.

4,840,673

ANISOTROPIC CELLULOSE ARTICLES, FIBERS, AND FILMS AND METHOD OF PRODUCING SAME

John A. Cuculo; Michael H. Theil; Kap S. Yang, and Yue S. Chen, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 937,034, Dec. 2, 1988, Pat. No. 4,750,939.
This application Mar. 9, 1988, Ser. No. 166,041
Int. Cl.[4] C08L *1/00;* D01F *2/00*
U.S. Cl. 106—198 22 Claims



1. A cellulose fiber formed from a lyotropic mesophase solution of cellulose in an ammonia/ammonium thiocyanate solvent.

4,840,674

INK COMPOSITIONS

William M. Schwarz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1987, Ser. No. 56,202
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 18 Claims

1. An ink composition comprised of a major amount of water; an organic solvent consisting essentially of a solvent selected from the group consisting of tetramethylene sulfone; 1,1,3,3-tetramethyl urea; and 3-methyl sulfolane; which solvent has permanently dissolved therein spirit soluble dyes selected from the group consisting of black, yellow, cyan, magenta, brown, and mixtures thereof, which dyes are substantially insoluble in aqueous media.

4,840,675

MOLD RELEASE COMPOSITION

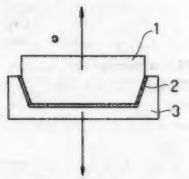
Shosin Fukui, Toyonaka; Masayoshi Shinjo, Settsu, and Hirokazu Aoyama, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

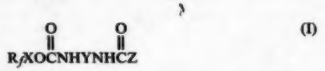
Continuation of Ser. No. 936,940, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 785,646, Oct. 9, 1985, abandoned, which is a division of Ser. No. 627,577, Jul. 3, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 249,191
Int. Cl.[4] B28B *7/36*
U.S. Cl. 106—38.22 7 Claims

1. A process for imparting releasing property against one of synthetic resin, natural resin, rubber and formed product thereof to a mold which comprises applying to the mold a composition comprising:

(A) at least one of

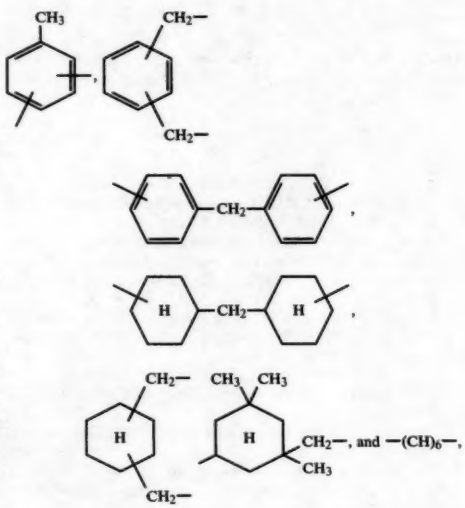
(1) a fluorine-containing urethane compound represented by the formula



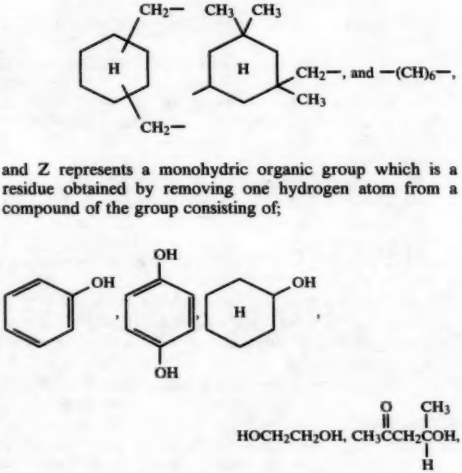


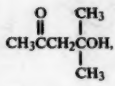
(I)

wherein R_f represents a perfluoroalkyl group having 4 to 20 carbon atoms, X represents a methylene group, $—CH_2CH(A)C_mH_{2m}—$ or $—SO_2N(R)C_tH_{2t}—$, A represents a hydrogen atom or hydroxyl group m is an integer of 0 to 4; and R represents a methyl or ethyl group, t is an integer of 1 to 4, Y represents a divalent group selected from the group consisting of;

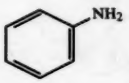


and Z represents a monohydric organic group which is a residue obtained by removing one hydrogen atom from a compound of the group consisting of;

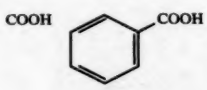




$C_nH_{2n+1}OH$ wherein n is an integer of 1 to 7, $C_nH_{2n+1}O(CH_2)_{n'}OH$ wherein n is an integer of 1 to 4 and n' is an integer of 2 to 4,

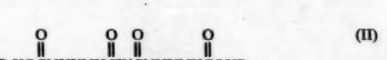


$C_nH_{n+1}NH_2$ wherein n is an integer of 1 to 3,



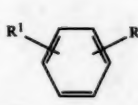
and C_nH_{2n+1} COOH wherein n is an integer of 1 to 3,

(2) a fluorine-containing urethane compound represented by the formula

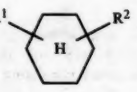


(II)

wherein R_f, X and Y are as defined above and W represents a divalent organic group which is a residue obtained by removing two hydrogen atoms from a compound selected from the group consisting of; $HO(CH_2)_kOH$ wherein k is an integer of 2 to 6, $HO(CH_2)_kNH_2$ wherein k is an integer of 2 to 6, $H_2N(CH_2)kNH_2$ wherein k in an integer of 2 to 6,



wherein R^1 and R^2 are the same or different and are each a hydroxyl group or amino group and



wherein R^1 and R^2 are as defined above, and

(3) a fluorine-containing urethane compound represented by the formula

(III)

wherein R_f, X and Y are as defined above, and

(B) at least one of members selected from the class consisting of silicone oil, a methyl silicone varnish, wax, and a highly fluorinated organic alkyl compound or amine compound.

4,840,676

INSOLUBLE PIGMENTS AND PREPARATION THEREOF

Howard W. Clark, and Tracy E. Chapman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 748,273, Jun. 24, 1985, abandoned. This application Jun. 20, 1986, Ser. No. 876,566

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[4] C09D *17/00*

U.S. Cl. 106—462 **44 Claims**

1. A water-insoluble pigment comprising a complex of a water insoluble inorganic anion exchange material with a layered structure and a water-soluble dye, said anion exchange material represented by the general formula

$$[M^{+2}Q^{+3}(OH)_{5-x}](A^{-1})_d(A^{-1})_e(A^{-3})_f(A^{-4})_g \cdot nH_2O$$

where M is a metal element or elements each with a positive valence of 2; Q is a metal element or elements each with a positive valence of 3; A^{-1}, A^{-2}, A^{-3}, and A^{-4} are each one or more exchangeable anions each having a negative valence of 1, 2, 3, and 4, respectively; and n, x, d, e, f and g are real numbers greater than or equal to zero and satisfy the following:

$$0 < x \leqq 1$$

$$d+2e+3f+4g=x$$

$$0 \leqq n \leqq 10.$$

4,840,677

PLATELETLIKE TWO-PHASE PIGMENT

Werner Ostertag, Gruenstadt, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 201,207

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718446; Jun. 13, 1987, 3719804

Int. Cl.[4] C09C *1/22*

U.S. Cl. 106—456 **14 Claims**

1. A plateletlike two-phase pigment based on aluminum-containing iron oxides, which has a core with a hematite structure of the composition

$$Al_xFe_{2-x}O_3$$

where x is from 0.02 to 0.5, and an outer layer with a spinel structure of the composition

$$Al_yFe_{3-y}O_{4+z}$$

where y is from 0.03 to 0.75 and z is from 0 to 0.5.

4,840,678

PIPE COIL COOKER

Herman J. van der Schaaf, Wilnis, Netherlands, assignor to B. V. Gerbs. ter Braak, Netherlands

Filed Mar. 25, 1985, Ser. No. 715,639

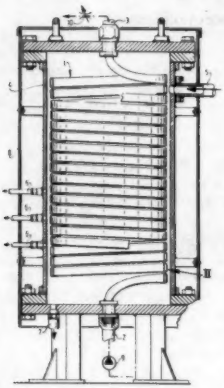
Claims priority, application Netherlands, Mar. 26, 1984, 8400950

Int. Cl.[4] B01J *3/00*; C13F *1/00*; B01D *1/00*

U.S. Cl. 127—2 **8 Claims**

1. Apparatus for cooking sugar comprising a tubular coil wound about a longitudinal axis which is substantially vertically disposed, said coil including an inlet at the lower portion thereof and an outlet at the upper portion thereof, means in communication with said inlet for forcing a mixture of sugar, water and additives upwardly through said coil, a heating jacket disposed in surrounding relationship to said coil, means in communication with said heating jacket for providing a heating medium within said jacket to heat the mixture passing

through said coil to a high temperature at which sugar crystals dissolve so as to provide a clear sugar solution at said outlet, and means in communication with said outlet for controlling



the operational pressure within said coil, said coil being of rounded-off rectangular cross-section to ensure optimum heat transfer by improving the heat transfer per unit weight of the mixture of sugar, water and additives forced through the coil.

4,840,679

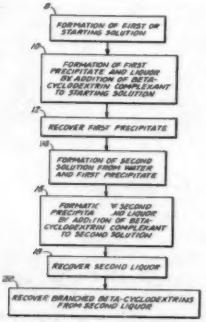
PURIFICATION AND SEPARATION OF BRANCHED BETA-CYCLODEXTRINS

Robert N. Ammeraal, Worth, Ill.; Allan R. Hedges, Crown Point, and David J. Gottneid, Griffith, both of Ind., assignors to American Maize-Products Company, Stamford, Conn.

Filed Jul. 8, 1987, Ser. No. 71,097

Int. Cl.[4] C13K *1/08*

U.S. Cl. 127—40 **15 Claims**


FORMATION OF FIRST OR STARTING SOLUTION
FORMATION OF FIRST PRECIPITATE AND LIQUOR BY ADDITION OF BETA-CYCLODEXTRIN COMPLEXANT TO STARTING SOLUTION
RECOVER FIRST PRECIPITATE
FORMATION OF SECOND SOLUTION FROM WATER AND FIRST PRECIPITATE
FORMATION OF SECOND PRECIPITATE AND LIQUOR BY ADDITION OF BETA-CYCLODEXTRIN COMPLEXANT TO SECOND SOLUTION
RECOVER SECOND LIQUOR
RECOVER BRANCHED BETA-CYCLODEXTRINS FROM SECOND LIQUOR

1. A method for purifying and separating branched beta-cyclodextrins comprising the steps of:

(a) forming a first precipitate and a first liquor by adding a beta-cyclodextrin complexant to a first solution, said first solution having a solids concentration of about 24 to about 40% by weight;

(b) recovering said first precipitate;

(c) washing said first precipitate with water to remove a portion of acyclic dextrins from said first precipitate;

(d) forming a second solution by mixing water with the washed first precipitate;

(e) forming a second precipitate and a second liquor by adding a beta-cyclodextrin complexant to the second solution;

(f) recovering said second liquor; and

(g) recovering a purified branched beta-cyclodextrin from said second liquor.

4,840,680

METHOD FOR DEGREASING A COLD ROLLED METALLIC BAND

Robert Wang, Wissous, France, assignor to Societe Stein Heurtey, Z.A.I., Ris Orangis, France

Continuation-in-part of Ser. No. 720,600, Apr. 5, 1985, abandoned. This application May 8, 1987, Ser. No. 48,468

Claims priority, application France, Sep. 28, 1984, 84 14950; Apr. 5, 1985, 84 05366

Int. Cl.[4] B08B *5/00;* **C23G** *5/00*

U.S. Cl. 134—40 **7 Claims**

1. A method of continuously removing grease from a cold rolled metallic band by the chemical effects of an atmosphere of a specific composition, which consists essentially of heating the grease-containing cold rolled metallic band at a temperature of between 350° C. and 700° C. in an enclosure provided with means for heating the grease-containing cold rolled metallic band and vaporizing the grease from the metallic band, and contacting the grease vapors with a gaseous atmosphere introduced into the enclosure, which gaseous atmosphere chemically decomposes the grease by a reaction between the gaseous atmosphere and the vaporized grease, said gaseous atmosphere consisting essentially of a mixture of nitrogen and hydrogen enriched with water in the form of steam, said hydrogen being present in an amount of 2 to 30 percent and the steam being present in an amount of 5 to 30 percent based on the complete gaseous mixture.

4,840,681

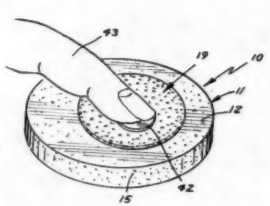
CONTACT LENS CLEANING DEVICE AND METHOD

Larry W. Pompe, 115-½E. Litchfield Ave., Willmar, Minn.

Division of Ser. No. 22,813, Mar. 9, 1987, Pat. No. 4,779,300. This application Aug. 10, 1988, Ser. No. 230,438

Int. Cl.[4] B08B *1/00*

U.S. Cl. 134—42 **10 Claims**



1. A method of cleaning a contact lens comprising:

providing an annular member with outer uninterrupted side walls and an inner side walls defining a central opening covered with a cleaning pad spanning the central opening and having edges overlapping the outer side walls;

providing a base having inner side walls defining a mounting opening with a shape and dimension corresponding to the outer side walls of the annular member, with the annular member fitted into the mounting opening with the cleaning pad edges engaged between the inner walls defining the mounting opening and the outer side walls of the annular member;

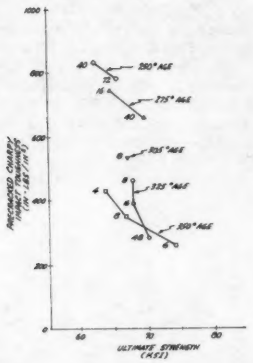
applying a lens cleaning solution to the portion of the cleaning pad spanning the opening of the annular member;

applying a contact lens in reciprocal motion to the side of the cleaning pad having the cleaning solution to clean the contact lens.

4,840,682
LOW TEMPERATURE UNDERAGING PROCESS FOR LITHIUM BEARING ALLOYS

R. Eugene Curtis, Issaquah; G. Hari Narayanan, Seattle, and William E. Quist, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 21, 1985, Ser. No. 800,503
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A 7 Claims



1. A process for improving the fracture toughness of an aluminum-lithium alloy without detracting from the strength of said alloy, said alloy consisting essentially of:

Element	Amount (wt. %)
Li	1.0 to 3.2
Mg	0 to 5.5
Cu	0 to 4.5
Zr	0.08 to 0.15
Mn	0 to 1.2
Fe	0.3 max
Si	0.5 max
Zn	0.25 max
Ti	0.15 max
Other trace elements	
each	0.05 max
total	0.25 max
Al	Balance,

said alloy first being formed into an article, solution heat treated and quenched, said process comprising the step of aging said alloy article to a predetermined underaged strength level at from about 200° F. to less than 300° F.

4,840,683
AL-CU-LI-MG ALLOYS WITH VERY HIGH SPECIFIC MECHANICAL STRENGTH

Bruno Dubost, St. Egreve, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Continuation of Ser. No. 710,699, Mar. 11, 1985, abandoned.
This application Feb. 16, 1988, Ser. No. 158,048
Claims priority, application France, Mar. 15, 1984, 84 04483
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A 18 Claims

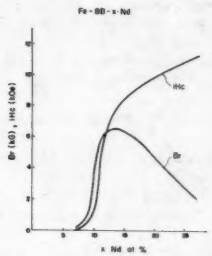
1. A heat treated and aged aluminium based alloy of very high specific mechanical strength, consisting essentially of (as % by weight):

Cu from 2.4 to 3.5%
Li from 1.9 to 2.7%
Mg from about 0.26 to 0.8%
Fe≦0.20%
Si≦0.10%
Mn from 0 to 1%
Cr from 0 to 0.30%
Zr from 0 to 0.20%
Ti from 0 to 0.10%
Be from 0 to 0.02%
Other substances (impurities)
each<0.05%
total<0.15%
remainder Al.

4,840,684
ISOTROPIC PERMANENT MAGNETS AND PROCESS FOR PRODUCING SAME

Setsuo Fujimura, Kyoto; Masato Sagawa, Nagaokakyo, and Yutaka Matsuura, Ibaraki, all of Japan, assignors to Sumitomo Special Metals Co, Ltd., Osaka, Japan

Filed Dec. 30, 1983, Ser. No. 567,640
Claims priority, application Japan, May 6, 1983, 58-79096; May 6, 1983, 58-79098; May 31, 1983, 58-94876
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—302 13 Claims



1. A powder metallurgically sintered, isotropic permanent magnet having a mean crystal grain size of 1–80 microns and consisting essentially of, by atomic percent, 12–20 percent R wherein R is at least one element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and wherein at least 50% of R consists of Nd and/or Pr, 5–18 percent B and at least 62 percent Fe, in which at least 50 vol % of the entire magnet is occupied by a ferromagnetic compound having an Fe-B-R type tetragonal crystal structure, said magnet having a maximum energy product of at least 4 MGOe and an intrinsic coercivity of at least 1 kOe.

2. A powder metallurgically sintered, isotropic permanent magnet having a mean crystal grain size of 1–80 microns and consisting essentially of, by atomic percent, 12–20 percent R wherein R is at least one element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and wherein at least 50% of R consists of Nd and/or Pr, 5–18 percent B, at least one additional element M selected from the group given below in the amounts not exceeding the atomic percentages specified below, wherein the sum of M does not exceed the maximum value of any one of the values specified below for M actually added and at least 62 percent Fe:

7.8% Al, 3.8% Ti, 7.8% V, 6.9% Cr, 6.9% Mn, 4.8% Zr, 4.5% Hf, 10.0% Nb, 8.8% Ta, 7.6% Mo, 5.0% Ge, 2.0% Sb, 2.7% Sn, 4.2% Bi, 3.8% Ni, and 7.9% W,

in which a ferromagnetic compound having an Fe-B-R type tetragonal crystal structure occupies at least 50 vol % of the entire magnet, said permanent magnet having a maximum energy product of at least 4 MGOe and an intrinsic coercivity of at least 1 kOe.

4,840,685

ALUMINUM ALLOY FOR THE SUBSTRATE OF MAGNETIC DISK

Motohiro Nabae, Nikko, Japan, assignor to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 864,313, May 19, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 183,441
Claims priority, application Japan, May 21, 1985, 60-108800
Int. Cl.[4] C22C *21/00*
U.S. Cl. 148—439 10 Claims

1. An aluminum alloy, suitable as a substrate for a magnetic disk, consisting essentially of 2 to 6 wt.% of Mg, and 0.12 to 2.0 wt.% of Cu; or 2 to 6 wt.% of Mg, and 0.28 to 7.0 wt.% of Zn; or 2 to 6 wt.% of Mg, 0.12 to 2.0 wt.% of Cu and 0.28 to 7.0 wt.% of Zn, wherein each aluminum alloy contains not more than 0.06 wt.% of Fe, and from an effective amount of two or more of Cr, Zr, Ti and B to not more than a total of 0.5 wt.% thereof, to render minute crystal particles in said alloy, thereby rendering the surface of said alloy smooth after plating, with the proviso that the total content of Cr and Zr is not more than 0.3 wt.%, and the total content of Ti and B is not more than 0.05 wt.%.

4,840,686

BAINITIC CORE GRINDING ROD

Charles R. Arnett, Kansas City, Mo., and James P. Bruner, Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Apr. 6, 1988, Ser. No. 178,404
Int. Cl.[4] C22C *38/22*
U.S. Cl. 148—334 14 Claims

14. A grinding rod for use in a rotating grinding mill, comprising:

a heat treated carbon or alloy steel grinding rod having a surface and a core,

said rod including at least 0.40 weight % chromium, at least 0.30 weight % molybdenum, and less than 0.7 weight % manganese,

said surface having a microstructure that is substantially martensite having a hardness of at least about HRC 60,

said core having a microstructure that is at least about 50% bainite having a hardness of at least about HRC 40 wherein said rod has improved wear resistance and improved breaking resistance.

4,840,687

EXPLOSIVE COMPOSITIONS

John W. Forsberg, Mentor-on-the-Lake, Ohio; John J. Mullay, Hazleton, and Joseph A. Sohara, Whitehall, both of Pa., assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 14, 1986, Ser. No. 931,377
Int. Cl.[4] C06B *45/00*
U.S. Cl. 149—2 44 Claims

1. An explosive composition comprising a discontinuous oxidizer phase comprising at least one oxygen-supplying component, a continuous organic phase comprising at least one water-immiscible organic liquid, and an emulsifying amount of at least one nitrogen-containing emulsifier derived from

(A) at least one carboxylic acylating agent,

(B) at least one polyamine, and

(C) at least one acid or acid producing compound said acid or acid-producing compound (C) being bonded to said polyamine (B) through at least one salt linkage,

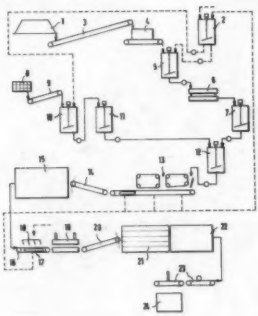
said acid or acid-producing compound (C) being: at least one polycarboxylic acid or acid-producing compound; at least one fatty acid or acid-producing compound containing at least about 12 carbon atoms; at least one hydrocarbyl-substituted carboxylic acid or acid-producing compound, the hydrocarbyl substituent of said acid or acid-producing compound having an average of at least about 10 aliphatic carbon atoms; at least one anhydride, ester or halide of a phosphorus acid; at least one phosphinyl or phosphonous acid or acid-producing compound; at least one oxyphosphorus, thiophosphorus, or oxythiophosphorus acid or acid-producing compound; nitric acid; nitrous acid; sulfurous acid; hydrochloric acid; silicic acid; boric acid; perchloric acid; chloric acid; chlorous acid; hypochlorous acid; permanganic acid; chromic acid; dichromic acid; hydrofluoric acid; hydrobromic acid; hydriodic acid; hydrosulfuric acid; or a mixture of two or more thereof.

4,840,688

METHOD FOR THE PRODUCTION OF FIBROUS PLASTER BOARDS

Winold Vogt, Rothenburg, Fed. Rep. of Germany, assignor to Pfleiderer Industrie GmbH & Co., KG, Neumarkt, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,883
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730585; European Pat. Off., Aug. 13, 1988, 88113212.0
Int. Cl.[4] B32B *13/02*
U.S. Cl. 156—39 8 Claims



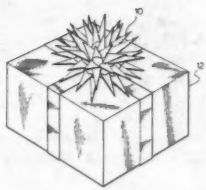
1. A method for the production of fibrous plaster boards comprising preparing a suspension from wet-digested fiber material and calcium sulfate dihydrate, dewatering the suspension to a residual moisture content of 30 to 40% while simultaneously forming the suspension into boards, recrystallizing the dihydrate by heating the boards in air and without pressure to convert the dihydrate to a beta form of a hemihydrate, and setting the boards by aspirating water through the boards by suction.

4,840,689

ORNAMENT PRODUCTION

Olaf B. Raiskums, Brampton, and James D. Mancel, Aurora, both of Canada, assignors to Raiman Design, Inc., Wilmington, Del.

Filed Jun. 16, 1988, Ser. No. 207,578
Int. Cl.[4] B31F *1/00*
U.S. Cl. 156—217 26 Claims



1. A method of producing a hemispherically-shaped ornament having a plurality of radiating conical points, the method comprising the steps of:

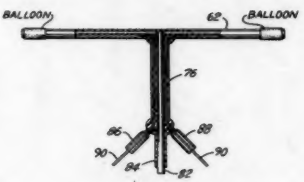
providing a strip of flexible material;
cutting out of said strip a strip of longitudinally spaced-apart blanks, each blank having transversely opposed petals and a central portion therebetween;
forming said petals into cones to produce elements with opposed cones;
separating said elements;
stacking a plurality of said elements in a circular arrangement; and
compressing and connecting said central portions together.

4,840,690

METHOD OF CONSTRUCTING A BLOOD FLOW CONDUIT

Lev A. Melinyshyn, Mt. Prospect; Jeffrey M. Stupar, Chicago, and Edward M. Goldberg, Glencoe, all of Ill., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 899,624, Aug. 25, 1986, Pat. No. 4,731,055. This application Mar. 10, 1988, Ser. No. 166,140
Int. Cl.[4] B29C *65/54*; A61M *29/02*
U.S. Cl. 156—242 **5 Claims**



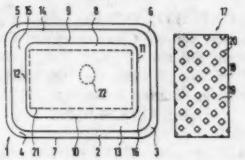
1. A method of constructing a blood flow conduit from a first resilient tube having a central lumen and a first inflation lumen along its inner surface, and a second resilient tube having a central lumen and two second inflation lumens along its inner surface, comprising:
forming first balloon inflation openings in the wall of said first resilient tube adjacent to its ends and in communication with said first inflation lumen;
positioning balloon collars adjacent to the ends of said first tube over said first balloon inflation openings and sealing the edges of said collars to said first tube;
forming a receiving opening passing through the wall of said first tube and, on either side of said receiving opening forming second balloon inflation openings in the wall of said first resilient tube in communication with said first inflation lumen;
positioning said second tube opposite said receiving opening with said second inflation lumens opposite said second balloon inflation openings;
forming third balloon inflation openings in the wall of said second resilient tube in communication with each of its second inflation lumens and positioning inflation means for facilitating connection with an external source of pressured fluid for expanding said balloon collars when said blood flow conduit is being used in a surgical procedure adjacent to each of said third balloon inflation openings;
passing a first thread through one of said inflation means and its corresponding third balloon inflation opening, second inflation lumen, second balloon inflation opening and into the corresponding section of said first inflation lumen;
passing a second thread through the other of said inflation means and its corresponding third balloon inflation opening, second inflation lumen, second balloon inflation opening and into the corresponding section of said first inflation lumen;
sealing said inflation means to the second tube and the intersection of the second tube to the first tube with a sealing medium; and
permitting said sealing medium to cure and then removing said first thread and said second thread.

4,840,691

PROCESS FOR PRODUCING FORMED AND LABELLED THREE DIMENSIONAL PLASTIC ARTICLES

Michael Knape, Marl, Fed. Rep. of Germany, assignor to Sendvac M. Knape GmbH & Co. Maschinen und Anlagen KG, Recklinghausen, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 924,622
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538528; European Pat. Off., Jun. 27, 1986, 86108804.5
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—245 **12 Claims**



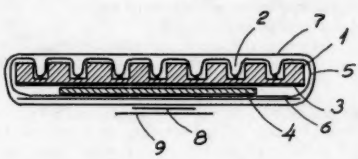
1. A process for producing formed labelled three dimensional plastic articles from a sheet of heated plastic film including the steps of providing at a first station a first sheet of the heated plastic film, shaping said sheet into a plurality of interconnected three dimensional articles, cooling the so formed sheet, at a second station providing an adhesive applicator and a label applicator, moving both of said applicators simultaneously, alternately aligning said applicators with said sheet and while said adhesive applicator is aligned with the sheet simultaneously applying adhesive to all of the shaped articles and simultaneously causing the label applicator to obtain a plurality of labels equal in number that of the articles, moving both of said applicators to align the label bearing applicator with the articles to which the adhesive has been applied and aligning the adhesive applicator with a source of adhesive, moving said label and adhesive applicators simultaneously to apply the labels and receive a new charge of adhesive.

4,840,692

METHOD FOR PRODUCING AN ABSORPTION BODY, NOTABLY FOR USE IN CASES OF URINARY INCONTINENCE IN WOMEN

Jorgen Kamstrup-Larsen, Allerod, Denmark, assignor to Coloplast A/S, Denmark

Continuation of Ser. No. 855,640, Apr. 16, 1986, abandoned. This application Nov. 18, 1987, Ser. No. 122,215
Claims priority, application Denmark, Aug. 21, 1984, 3988; PCT Int'l Appl., Aug. 21, 1985, PCT/DK85/00081
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—252 **14 Claims**



1. A method for producing an absorption body for use in cases of female urinary incontinence and containing a core in the form of one flat absorbent pad provided with channels, comprising the steps of:
(a) subjecting the sheet material with the deposited layer of

the mixture to a heat treatment at a temperature just sufficient to soften the thermoplastic surface of the said fibers and within the range of 90° to 175° C. so as to cause the fibers of which at least the surface is thermoplastic to adhere to each other at the spots of contact and to the sheet material, thereby forming a three-dimensional network in which the particles of the pulverulent material are evenly distributed, and

(c) cutting or milling the body to remove a substantial proportion of core material so as to form a plurality of channels in the surface of the thus-formed pad opposite the sheet material, the channels having a depth of 65–95% of the thickness of the pad, a width of each at least 4 mm and leaving at least 4 mm of core material between each two neighboring channels.

4,840,693

ORGANOPOLYSILOXANE HOT-MELT ADHESIVE

Toshio Suzuki, and Tadashi Okawa, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,694
Claims priority, application Japan, Jul. 23, 1987, 62-183944
Int. Cl.[4] C09J *3/02*
U.S. Cl. 156—329 **6 Claims**

1. A method of adhering a first substrate surface to a second substrate surface comprising the steps of:

(a) heating to at least 40° C. a material which comprises predominantly an organopolysiloxane which converts to an isotropic liquid at temperatures of at least 40° C. and which contains the R^1R^2SiO unit or $R^1R^2{}_2SiO_{1/2}$ unit, wherein R^1 is the $-R^3-CN$ group, in which R^3 is a divalent organic group having at least one aromatic ring, and R^2 is an alkyl group having from 1 to 4 carbon atoms,

(b) coating said heated material onto said first substrate surface,

(c) contacting said second substrate surface with said coated heated material, and

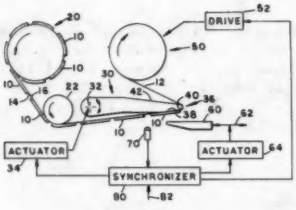
(d) then allowing said coated material to cool until said material is in a nonfluid state.

4,840,694

METHODS AND APPARATUS FOR HANDLING DOUBLE-SIDED ADHESIVE TABS

Donald L. Brookman; David E. Merrill, both of Richmond, and Everett C. Grollimund, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,665
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—344 **5 Claims**



5. The method of removing double-sided adhesive tabs from the surface of a carrier tape to which said tabs are initially releasably adhesively secured, said method comprising the steps of:

feeding said carrier tape around a convex nose structure so that the tabs are on the side of said carrier tape which becomes convex as said carrier tape passes said nose structure in order to peel the carrier tape from a tab adjacent said nose structure;

contacting said tab adjacent said nose structure with a member, said member contacting the surface of said tab remote from said carrier tape in order to adhesively secure said tab to said member; and

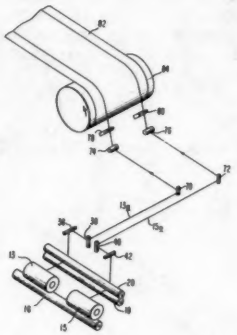
moving said member in synchronization with said tab adjacent said nose structure in order to support said tab after said carrier tape has been completely peeled away from said tab.

4,840,695

METHOD FOR UNWINDING ELASTIC TAPE

Thomas E. Benim, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 27, 1988, Ser. No. 149,156
Int. Cl.[4] B32B *31/14*
U.S. Cl. 156—344 **2 Claims**



1. A method of unwinding from the surface of a package an elastic strip material wound on the package, said strip having a peel resistance of from about 5 to about 25 grams/mm, said method comprising: rotating the package at a substantially constant peripheral rate of speed; pulling said strip material from said package at a location on said surface; and heating the surface of said package from a temperature of about 25° to about 50° C. to reduce the peel resistance by about 50 to 75%.

4,840,696

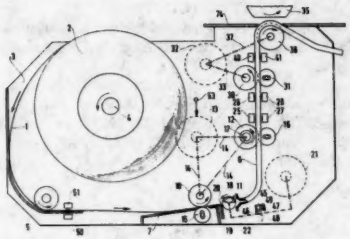
LABEL DISPENSER AND A FRANKING MACHINE EQUIPPED WITH SAID DISPENSER

Marek Krasuski, Fontenay Aux Roses; Jean-Pierre Grégoire, Bagneux, and Claude Gerbaud, Massy, all of France, assignors to SMH Alcatel, Paris, France

Continuation of Ser. No. 855,258, Apr. 24, 1986, Pat. No. 4,652,330. This application Oct. 5, 1987, Ser. No. 105,479
Claims priority, application France, Apr. 24, 1985, 85 06266
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.[4] B65H *26/00*
U.S. Cl. 156—353 **14 Claims**

1. In a label dispenser for selectively dispensing labels of different lengths from a continuous tape, the dispenser comprising a cutter and intermittent drive means for intermittently driving the tape, said intermittent drive means and cutter being mounted on a tape guide path, said dispenser further including control means for controlling said intermittent drive means and said cutter, the improvement wherein said intermittent drive means includes first drive means upstream of said cutter and second drive means downstream of said cutter for ensuring that said tape is held stationary or driven at the same given tape advance speed from points located both upstream and downstream from said cutter, said dispenser further including a first photoelectric cell for detecting the leading end of the tape on its guide path at an initial position which is located at a distance

downstream from said cutter which is no greater than the length of the shortest selectable label, and a second photoelectric cell for detecting the advance of the tape from its initial position, said first and second cells being mounted downstream from said cutter at respective distances equal to different label lengths and being connected to said control means, said dispenser further including independent ejector means for ejecting each cutoff label at an ejection speed greater than said tape advance speed, said ejector means being mounted downstream from at least said first cell and being separated from said second drive means by a distance which is less than the length of the shortest label whereby said intermittent drive means operates to advance the leading end of said continuous tape for severance of labels of different lengths independently of said ejector means and vice versa, and whereby, irrespective of the lengths of the labels cut from said tape, said ejector means operating at an ejection speed greater than said tape advance speed to separate a severed label from the tape to allow said first and second photoelectric cells to detect advance of the tape after passage through the second drive means for controlled severance of a succeeding label of either length.



4,840,697

APPARATUS FOR HANDLING SHEET MATERIAL

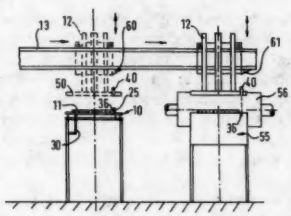
Anthony G. Goodfellow, Maghull, and Anthony R. Wright, Southport, both of England, assignors to W&A Bates Limited, United Kingdom

Division of Ser. No. 697,243, Feb. 1, 1985, Pat. No. 4,714,505. This application Oct. 2, 1987, Ser. No. 103,665

Claims priority, application United Kingdom, Feb. 10, 1984, 8403494

Int. Cl.[4] B29D *30/30*

U.S. Cl. 156—405.1 **9 Claims**



1. A tire building server feeding a ply of tire building fabric to a tire building former and comprising:

a table having a surface thereon on which said ply of the tire building fabric can be laid,

means for tilting the table and means for supplying air to the surface of the table to enable the tire building fabric thereon to be aligned with one longitudinal edge of said fabric in alignment with a first abutment arranged on a first datum line,

a gripping device for picking up said ply of tire building fabric in a flat condition, said gripping device being flat and of similar area to that of the table, and being arranged to be transversely movable and hold said ply of tire building fabric in an alignment preserving manner automatically to align said longitudinal edge with a second datum line substantially parallel with the first datum line so as to enable said ply of tire building fabric to be fed in appropriate alignment to a tire building former.

4,840,698

APPARATUS FOR LAMINATING A FILM UNDER PRESSURE AND HEAT

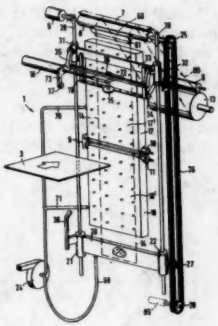
Hans-Guenter E. Kuehnert, Erzhausen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main and ELTI Apparatebau und Elektronik GmbH, Erzhausen, both of, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,831

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420429

Int. Cl.[4] B65C *1/00*; B44C *1/00*; B65H *5/12*

U.S. Cl. 156—485 **35 Claims**



1. An apparatus for laminating a film under pressure and heat onto opposite sides of a carrier, said opposite sides each being heated before the laminating starts, comprising:

a single supply roll of a photoresist film to be laminated simultaneously to opposite sides of said carrier, said supply roll being mounted in a pivoting frame which is horizontally pivotable about a vertical axis, said pivoting frame being located behind an upper vacuum table of a laminating station in the direction of transport of the carrier;

a magazine for releasably suspending each of a plurality of carriers to be laminated, said carriers being vertically upstanding;

a heating station for heating the carriers, said heating station having two horizontally revolving endless conveyor belts, each of which is in contact with an electric heating element, said heating station being located in front of a laminating station in the direction of transport of the carrier;

said laminating station, comprising (i) a pair of laminating rollers forming a nip and (ii) a plurality of vertically aligned vacuum tables, each vacuum table of said plurality having a suction plate for vertically fixing the photoresist film;

a cutting device for cutting the photoresist film over the width of said film, wherein the cutting device is movable along vertical guide rods which extend vertically on both sides of the vacuum tables;

a knife carrier with a rack mounted pivotally on guides connected to one another by a cross-member and which can be displaced vertically and retained along the guide rods by a clamping piece or an electric positioning device;

roller conveyor means for moving the carrier horizontally

along a path through said heating station, a lateral aligning device and a board gripper, there being a stop that is pivotable into and out of the path of the roller conveyor means such that when said stop is pivoted into said path, a front edge of the carrier abuts the stop;

said vacuum tables located vertically above and below the pair of laminating rollers;

a gripper bar which is a vacuum bar and is adapted to grasp a strip-shaped portion of the photoresist film, said gripper bar having two guides;

means for moving the gripper bar vertically downward along vertical guide rods parallel to one another out of an adjustable position above the laminating station, beyond the laminating station, and into a position in the region of the lower vacuum table; and

a chain connection fastened to one of said two guides of the gripper bar, said chain connection being connected frictionally to an endless revolving drive chain which is guided around two chain wheels, wherein said gripper bar is movable, together with the two guides, along the vertical guide rods by said endless revolving drive chain.

4,840,699

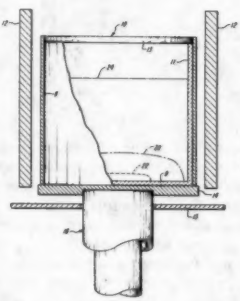
GALLIUM ARSENIDE CRYSTAL GROWTH

Chandra P. Khattak, Danvers; Vernon E. White, Needham; Frederick Schmid, Marblehead, and John H. Wohlgemuth, Acton, all of Mass., assignors to Ghemini Technologies, Salem, Mass.

Continuation of Ser. No. 65,163, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 779,817, Sep. 25, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 142,310

Int. Cl.[4] C30B *11/00*

U.S. Cl. 156—616.41 **12 Claims**



1. A process for growing semi-insulating gallium arsenide ingots in a sealed silica crucible comprising the steps of:

providing a silica crucible,

placing gallium arsenide meltstock in said crucible,

raising the temperature of said crucible to a temperature above the melt point of said meltstock and maintaining said temperature above said melt point for a length of time sufficient to melt said meltstock, and

thereafter directionally solidifying said meltstock by withdrawing heat from the center bottom portion of said crucible while simultaneously applying heat to the side walls of said crucible,

the temperature of the center bottom of said crucible being maintained below the melt point and the temperature of the upper portion of the side walls of said crucible being maintained above said melt point until substantially all of said meltstock has been solidified, wherein:

no encapsulant is placed within said crucible;

said crucible is sealed with a silica cover plate after said gallium arsenide is placed therein; and,

said withdrawing and said applying are independently controlled such that the interface between solidified gallium arsenide and liquid gallium arsenide is convex to the liquid and advances outwardly and upwardly from said center bottom portion, and the temperature gradients within the liquid portion of said gallium arsenide are maintained sufficiently low such that said solidified meltstock forms an ingot that, except adjacent the sides thereof, is crack-free.

4,840,700

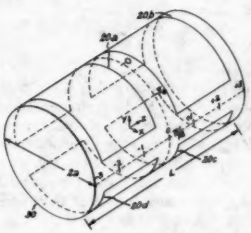
CURRENT STREAMLINE METHOD FOR COIL CONSTRUCTION

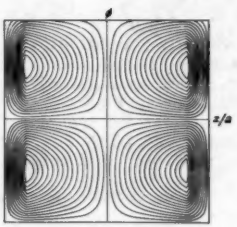
William A. Edelstein, and Frederick Schenck, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 795,024, Nov. 4, 1985, abandoned, which is a continuation of Ser. No. 548,041, Nov. 2, 1983, abandoned. This application Jul. 13, 1987, Ser. No. 73,552

Int. Cl.[4] B44C *1/22*; H01F *7/06*

U.S. Cl. 156—634 **10 Claims**





1. A method for producing an electrical coil for generating magnetic fields said method comprising the steps of:

calculating a pattern of current paths on a curved three dimensional surface at least partially enclosing a volume, said current paths corresponding to a specified continuous current distribution which is capable of generating a desired magnetic field within said volume, said pattern of current paths being a sequence of arcs on said curved surface;

providing a continuous conductive layer mounted on an insulative substrate which is conformable to said curved surface;

removing a thin line of conductive material from said conductive layer on said insulative substrate, said conductive material being removed along said pattern of current paths, the thinness of said line of removed material being measured relative to said remaining conductive material in which conductive current paths in said conductive layer are thereby formed; and

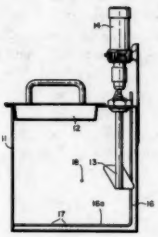
disposing said conductive layer so as to conform to said curved surface.

4,840,701

ETCHING APPARATUS AND METHOD

Ronald C. Stern, Hoddesdon, Great Britain, assignor to STC PLC, London, England

Filed Jun. 23, 1988, Ser. No. 210,333
Claims priority, application United Kingdom, Aug. 14, 1987, 8719306
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—637 8 Claims



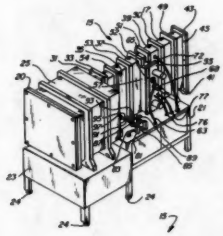
4. A method of etching a single crystal semiconductor substrate, the method including exposing a selected region of the substrate to a liquid etch, agitating the etchant adjacent the substrate, and injecting oxygen, an inert gas or mixtures thereof into the etchant adjacent the substrate thereby achieving uniform etching of the substrate.

4,840,702

APPARATUS AND METHOD FOR PLASMA TREATING OF CIRCUIT BOARDS

John E. Schumacher, III, Boulder, Colo., assignor to Action Technologies, Inc., Boulder, Colo.

Filed Dec. 29, 1987, Ser. No. 138,962
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*
U.S. Cl. 156—643 22 Claims



1. A method for treating objects using a gas excited within an electrical field, said method comprising:

establishing an excited gas zone having the gas excited within the electrical field thereat;

establishing a gas zone having gas therein not exposed to the electrical field so that the gas thereat remains substantially unexcited; and

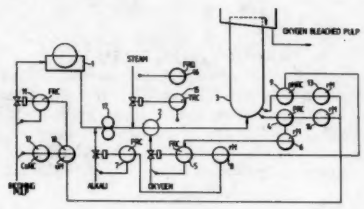
exposing said objects alternately to said unexcited gas and said excited gas for preselected periods of time.

4,840,703

METHOD FOR CONTROLLING AN OXYGEN BLEACHING

Erkki Malmsten, Rauma, Finland, assignor to Rauma-Repola Oy, Pori, Finland

Continuation of Ser. No. 948,459, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 744,985, Jun. 17, 1985, abandoned. This application Jun. 28, 1988, Ser. No. 213,516
Claims priority, application Finland, Nov. 8, 1984, 844390
Int. Cl.[4] D21C *7/12, 9/147*
U.S. Cl. 162—49 4 Claims



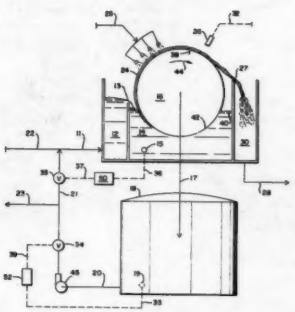
1. Method for controlling an oxygen-bleaching process of lignocellulose pulp stock to a desired degree of delignification comprising adding alkali oxygen at a desired ratio to the pulp stock, passing the pulp at a desired substantially constant temperature into and out of the bleaching reactor wherein the pulp has a substantially constant level at its outlet measuring the hydrostatic pressure at the bottom of the reactor and adjusting the quantity of feed of oxygen in response to the measured hydrostatic pressure, to a value to reach the desired degree of delignification; and adjusting the amount of alkali added in response to the adjusted amount of oxygen to maintain the alkali and oxygen ratio at the desired ratio.

4,840,704

CONTROLLING CHARACTERISTICS OF A PULP MAT ON A PULP WASHING SURFACE

George W. Seymour, 2841 Parkwood Dr., Brunswick, Ga. 31520

Filed Mar. 21, 1988, Ser. No. 170,299
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] D21C *9/00*
U.S. Cl. 162—49 10 Claims



1. In a pulp washing process wherein a cellulosic pulp slurry stream and a dilution liquid stream are continuously introduced to form a level of admixture of these streams comprising pulp and water in a container wherefrom a mat comprising pulp and water continuously forms on a washing surface which is moved at a surface speed and wherein wash water is directed at said mat on said washing surface and vacuum filtering is

carried out to produce a product stream of washed pulp and water at a downstream location on said surface and a filtrate which is divided so that part of it is recirculated to provide said dilution liquid stream, the improvement comprising the steps of:

(a) determining the total mass of said product stream in weight per unit area on said surface and adjusting said surface speed in response to said determination to reach a selected value for said total mass,

(b) adjusting the rate of said dilution liquid stream introduction in response to a level sensor in said container to reach a selected level of said admixture in said container.

4,840,705

PAPERMAKING METHOD

Hisao Ikeda; Fumio Suzuki; Yoshitane Watanabe; Mitsunobu Matsumura; Yasuhiro Takahashi; Hirosi Murakami, and Koichi Maeda, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

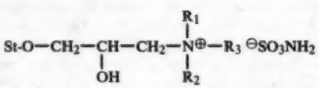
Filed Jan. 25, 1988, Ser. No. 147,851

Claims priority, application Japan, Feb. 2, 1987, 62-22092

Int. Cl.[4] D21H *3/28*

U.S. Cl. 162—175 **8 Claims**

1. A papermaking method comprising the steps of sheet-formation of an aqueous papermaking stock which contains a cellulose fiber or the said fiber and an inorganic filler, dewatering and drying, characterized by the addition of a starch ether derivative of a general formula (I):



(I)

where St-O represents a starch molecule residue, R_1, R_2 and R_3 independently represent an alkyl group having from 1 to 18 carbon atoms or a benzyl group, provided that two or more of these R_1, R_2 and R_3 must not be a benzyl group or an alkyl group having from 5 to 18 carbon atoms at the same time, and any two of these R_1, R_2 and R_3 may be bonded to form a cyclic structure, the said derivative containing the ether bond in a degree of substitution of from 0.01 to 0.1, to the said papermaking stock in an amount of from 0.05 to 5.0% by weight of the cellulose fiber or the total of the said fiber and the inorganic filler in the said stock.

4,840,706

METHOD AND APPARATUS FOR MEASURING WATER CONTENT

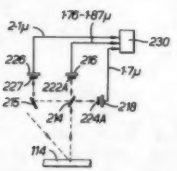
Neil F. Campbell, Canterbury, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 654,684, Sep. 26, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 15,592

Claims priority, application United Kingdom, Sep. 26, 1983, 8325691

Int. Cl.[4] D21F *7/06;* **G01N** *21/17*

U.S. Cl. 162—198 **18 Claims**



1. Apparatus for measuring the water content of a material over a predetermined range and having a source of infra-red radiation for directing at the material, detector means for such radiation and at least first and second filters for selecting radiation for detection at a first wavelength band at which the detected radiation is affected by water content and a second wavelength band at which the detected radiation is substantially unaffected by water content respectively, wherein first and second signals are produced in dependence upon the radiation detected at said first and second wavelength bands respectively, and means responsive to said first and second signals to derive a signal having a value representing the water content, the improvement wherein the first wavelength band at which said first filter responds has a center wavelength of approximately 1.83 microns, wherein said second filter wavelength band is removed from said first wavelength band to provide a response that is substantially independent of water content over the predetermined range and has a center wavelength of approximately 1.7 microns, and wherein the moisture ratio of the material lies in the range of 1 to 6.

4,840,707

SEPARATION OF 3-METHYL-2-BUTANONE FROM FORMIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and Richard R. Rall, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Dec. 30, 1988, Ser. No. 291,961

Int. Cl.[4] B01D *3/40;* **C07C** *45/83, 53/02*

U.S. Cl. 203—51 **4 Claims**

1. A method for recovering 3-methyl-2-butanone from mixtures of 3-methyl-2-butanone and formic acid which comprises distilling a mixture of 3-methyl-2-butanone and formic acid in a rectification column in the presence of about one part of an extractive agent per part of the 3-methyl-2-butanone—formic acid mixture, recovering 3-methyl-2-butanone as overhead product and obtaining the extractive agent and the formic acid from the stillpot, wherein said extractive agent comprises a dimethyl amide containing three or four carbon atoms.

4,840,708

PROCESS FOR THE PRECISE DETERMINATION OF THE SURFACE AREA OF AN ELECTRICALLY CONDUCTING SHAPED BODY

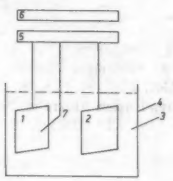
Jean-Claude Puippe, Grabenstrasse 7, 8304 Wallisellen, Switzerland

Continuation-in-part of Ser. No. 587,192, Mar. 7, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 844,216

Claims priority, application Switzerland, Mar. 11, 1983, 1353/83

Int. Cl.[4] G01N *27/26;* **C25D** *21/12*

U.S. Cl. 204—1 T **22 Claims**



1. A process for obtaining an absolute measurement of the surface area of an electrically conducting shaped body comprising:

selecting an electrolyte suitable for producing a diffusion controlled limiting current plateau in the polarization curve;

immersing the shaped body in the electrolyte;

applying a first electrical signal to the shaped body to cause a diffusion process in the electrolyte near the shaped body

which diffusion process is characterized by being diffusion rate limited; and

measuring a second electrical signal associated with the diffusion process and proportionally varying in relation thereto during the period of about the first 3 seconds after the application of the first electrical signal to obtain a measurement of the diffusion process from which the surface area of the shaped body may be determined.

4,840,709

SINGLE-STAGE ELECTROCHEMICAL IMAGE-FORMING PROCESS FOR REPRODUCTION LAYERS

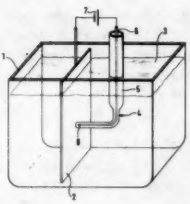
Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,308

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717652

Int. Cl.[4] C25D *9/02*

U.S. Cl. 204—2 **22 Claims**



1. A process for the electrochemical image formation on an electrically conductive substrate by the action of electric current, comprising the steps of:

contacting the substrate with an electrically conductive solution of an organic substance;

applying a direct voltage between the substrate and at least one electrode;

depositing said organic substance onto the substrate by current impulses, at a current density from about 0.01 to 100 A/dm^2.

4,840,710

METHOD OF STRIPPING ELECTROLYTICALLY DEPOSITED COPPER FROM A CATHODE

Bruce Middlin, Roxby Downs; Norman Locke, and Alan W. Kennedy, both of Townsville, all of Australia, assignors to M.I.M. Technology Marketing Limited, United Kingdom

Filed Oct. 27, 1987, Ser. No. 113,074

Claims priority, application Australia, Nov. 4, 1986, PH8801

Int. Cl.[4] C25D *1/20*

U.S. Cl. 204—12 **8 Claims**

1. A method of stripping electrolytically deposited copper from a cathode comprising:

maintaining said cathode in a generally vertical upright position by supporting the cathode along its lower edge not its upper edge;

flexing said cathode by an amount exceeding the strength of the adhesion bond between the deposited copper and the cathode but not exceeding the elastic limit of the cathode, thereby causing at least part of the deposited copper to separate from the cathode and

then wedge-stripping or gas-blasting the deposited copper from the cathode.

4,840,711

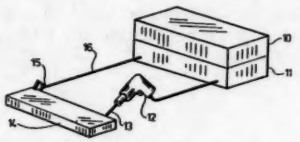
PROCESS FOR THE FUSION OF ONE ELEMENT INTO A SECOND ELEMENT

Ady Joseph, Ontario, Canada, assignor to Metafuse Limited, Ontario, Canada

Continuation of Ser. No. 888,272, Jul. 22, 1986, abandoned, Continuation of Ser. No. 768,189, Aug. 23, 1985, abandoned, which is a continuation of Ser. No. 684,157, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 604,392, Apr. 26, 1984, abandoned, which is a continuation of Ser. No. 319,672, Nov. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 224,762, Jan. 13, 1981, abandoned. This application Apr. 8, 1987, Ser. No. 36,202

Int. Cl.[4] C25D *32/00*

U.S. Cl. 204—15 **6 Claims**



1. A process for the fusion of at least one second conductive chemical element, in a dissociable form as part of a solution, into a matrix of a first conductive chemical element comprising the steps of:

placing the solution in contact with a selected area of the adjacent surface of said first conductive chemical element; and

applying an interrupted half-wave electrical pulsing signal within a frequency in the range of 400 Hz to 35 MHz to said solution and said first conductive chemical element, said signal having an amplitude of 3 amps per 0.3 square mm, whereby said second conductive chemical element is fused with said first conductive chemical element in said selected area without substantial generation of heat.

4,840,712

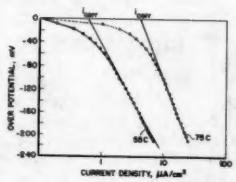
PROCESS FOR IMPROVING WEAR ON CONDUCTOR ROLLS IN ELECTROPLATING OF STEEL SURFACES

Richard N. Steinbicker, Allentown; Herbert E. Townsend, Center Valley, and Yung-Herng Yau, Allentown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 13, 1988, Ser. No. 256,977

Int. Cl.[4] C25D *5/04*

U.S. Cl. 204—28 **19 Claims**



1. In a process for electrodepositing a protective coating of zinc or a zinc alloy on iron or steel substrates in which said process utilizes a metal conductor roll or conductor roll with metal sleeves and contains a rinsing bath with a mineral acid solution associated with said roll, the improvement which comprises said mineral acid bath having at least 50 ppm of hydrogen peroxide or a peroxydisulfate compound.

4,840,713

PROCESS FOR THE ELECTROCHEMICAL ROUGHENING OF ALUMINUM FOR USE IN PRINTING PLATE SUPPORTS

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,307
Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717654
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.75 11 Claims

1. A process for electrochemical roughening of supports of aluminum and aluminum alloys for use in printing plates, comprising the steps of:

immersing the support in an electrolytic, acidic, unsaturated solution of aluminum chloride comprising from 5 to 100 g/l sulfate ions and from 1 to 100 g/l chloride ions; and

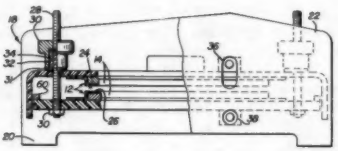
applying an alternating current to electrochemically roughen the support.

4,840,714

ELECTROBLOTTING TECHNIQUE FOR TRANSFERRING SPECIMENS FROM A POLYACRYLAMIDE ELECTROPHORESIS OR LIKE GEL ONTO A MEMBRANE

William J. Littlehales, Point Richmond, Calif., assignor to American Bionetics, Inc., Hayward, Calif.

Filed May 13, 1987, Ser. No. 49,739
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—180.1 32 Claims



17. A method of transferring a particular specimen from a polyacrylamide electrophoresis or like gel onto a transfer sheet by means of electroblotting, said method comprising the steps of:

(a) providing a pair of plate-shaped electrode assemblies having facing layers of electrically conductive material in a confronting relationship to one another;

(b) placing said gel and transfer sheet between said electrode assemblies such that the gel and transfer sheet are in a confronting relationship with one another;

(c) adjustably decreasing the spacing between said electrode assemblies at a plurality of different points on one of the assemblies so that the assemblies squeeze the gel and support sheet together while remaining substantially parallel at their adjusted position; and

(d) connecting said electrode assemblies to a source of power for producing an electric field across said gel and support sheet in order to transfer said specimen from the gel to the sheet by means of electroblotting.

4,840,715

ELECTRODEPOSITION COATING METHOD

Masayuki Misawa, Hiratsuka; Toshio Ogasawara, Kamakura; Masahiko Sagane, Fujisawa; Yasuyuki Hirata, Hatano, and Masafumi Kume, Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 938,983, Dec. 3, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 229,754
Claims priority, application Japan, Dec. 4, 1985, 60-272817
Int. Cl.[4] C25D *13/06*
U.S. Cl. 204—181.1 10 Claims

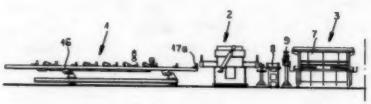
1. A method of electrodeposition coating, which comprises performing a first electrodeposition coating on an article as a cathode using (I) a cationic electroposition paint comprising (A) a polyamine resin and (B) at least one pigment, said pigment (B) containing at least 5% by weight of a pigment having an oil absorption of at least 100 and being incorporated so that the total oil absorption of the pigment (B) is in the range of 1,000 to 10,000 per 100 g of the resin (A), then while the resulting coated film is in the uncured state, performing a second electrodeposition coating on it using (II) an emulsion-type cationic electrodeposition coating paint comprising a resin (C) and a pigment (D) and having a minimum electrodeposition current density of not more than 0.7 mA/cm^2 and a degree of emulsification of at least 80% by weight, said pigment (D) having a lower total oil absorption than the total oil absorption of the pigment (B) in the cationic electrodeposition paint (I), and thereafter curing the applied films under heat to form a composite cured coated film.

4,840,716

AUTOMATIC PLANT FOR CONTINUOUS ELECTROPLATING TREATMENT OF METAL BARS

Sergio Angelini, Residenza del Cantone 061, Segrate (Milan), Italy

Filed Jun. 22, 1988, Ser. No. 209,996
Claims priority, application Italy, Jun. 22, 1987, 20990 A/87
Int. Cl.[4] C25D *19/00*
U.S. Cl. 204—207 15 Claims



1. Automatic plant for continuous electroplating treatment of metal bars, characterized by the fact that it comprises, successively, an automatic introduction unit for bars to be treated, a degreasing and cleaning unit for the bars, an electrolytic treatment unit having one or more consecutive cells and associated devices for electrical contact with the bars in movement, a handling device for the bars, a final burnishing or polishing unit for the bars and an extraction and storage unit for the treated bars, in which the automatic introduction unit for the bars possesses means for the mutual electrical and mechanical connecting together in alignment of the bars successively introduced, and the extraction unit possesses means for separating the successive bars and for storing them side by side, the handling device for the bars carrying out their entrainment in the axial direction and simultaneous rotation of the bars about themselves.

4,840,717

SILVER RECOVERY CELL

Milton A. Dzodin, 29733 Red Leaf Dr., Southfield, Mich. 48076

Filed Aug. 24, 1988, Ser. No. 235,676
Int. Cl.[4] C25C *1/20, 7/06*
U.S. Cl. 204—237 21 Claims

21. A silver recovery system, said silver recovery system

being used for recovering silver from a silver laden solution, said silver recovery system comprising:

at least one silver recovery cell, each said silver recovery cell comprising:

a clear canister, said clear canister having a closed bottom and an open end;

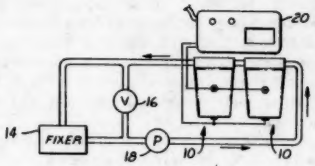
an anode rod attached to said bottom of said clear canister, said anode rod projecting upwardly into said clear canister;

an anode terminal electrically connected to said anode rod;

a cathode cylinder in said clear canister, said cathode cylinder encircling said anode rod, said cathode cylinder having a longitudinal slot; a cathode terminal electrically connected to said cathode cylinder;

a top releasably attached to said clear canister at said open end;

inlet means for introducing said silver laden solution into said clear canister;



outlet means for exiting said silver laden solution from said clear canister;

means for fluidically sealing said top with respect to said clear canister; and

an inlet port in fluidic communication with said inlet means, said inlet port being located in axial alignment with said anode rod, said inlet port causing flow of said silver laden solution to be sped up upon passage therethrough;

electrical means for selectively supplying electricity to said anode terminal and said cathode terminal;

piping means for selectively piping said silver laden solution from a first location to said recovery cell and back to said first location; and

pump means connected with said piping means for selectively pumping said silver laden solution from said first locatin to said inlet means of said recovery cell.

4,840,718

INERT COMPOSITE ELECTRODE, IN PARTICULAR AN ANODE FOR MOLTEN SALT ELECTROLYSIS

Christine Zöllner, and Herbert Hahn, both of Nuremberg, Fed. Rep. of Germany, assignors to C. Contradty Nürnberg GmbH & Co. KG, Röthenbach, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,677

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1985, 3537575

Int. Cl.[4] C25B *11/00*; C25C *7/02*; C25D *17/10*

U.S. Cl. 204—286 **17 Claims**

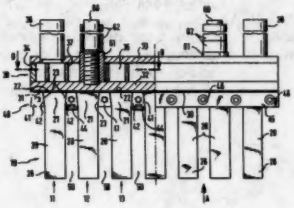
1. In an inert composite electrode for molten salt electrolysis consisting of

an active part in the form of a plurality of bar-shaped active elements (20) having end surfaces (22) and which are arranged in one or more mutually aligned groups and with their longitudinal axes mutually parallel,

an electrode holder which comprises a current feed plate (30), having one main surface (31) in firm contact with the active elements at their end surfaces, and

a connecting arrangement which connects the active elements together in groups and holds the active elements in contact with the plate, the improvement comprising:

the active elements (20) each have a respective head section (21) adjacent to the current feed plate (30), which section is widened in the direction of the end surface (22) adjacent to the plate substantially in a wedge shape with two oppositely-lying wedging surfaces (23), wherein the plane of said wedge-shape lies perpendicular to a line of alignment (25) along which the respective group of elements is aligned, and



at least one clamping element (41) having at least one wedging surface (42) is brought into contact with each of the two oppositely-lying wedging surfaces (23) of the head section (21) of the respective active element (20), wherein the wedging angle of the clamping element substantially corresponds to that of the respective wedging surface of the head section.

4,840,719

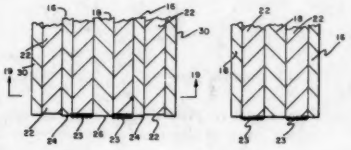
CORROSION PROBE AND METHOD FOR MEASURING CORROSION RATES

Raymond J. Jasinski, Tulsa, Okla., assignor to Cities Service Oil and Gas Corporation, Tulsa, Okla.

Division of Ser. No. 151,002, Feb. 1, 1988, Pat. No. 4,784,729, which is a division of Ser. No. 903,036, Aug. 29, 1986, Pat. No. 4,752,360, which is a continuation-in-part of Ser. No. 740,497, Jun. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,236, Aug. 31, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 242,143

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—404 **20 Claims**



1. A method for preparing a dielectric surface of a corrosion probe means to become ionically conductive when the corrosion probe means is inserted into a corrosive liquid environment containing a disperse phase having an ionically conductive solution, comprising the steps of:

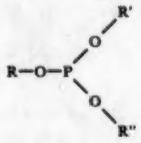
(a) contacting a dielectric surface of a corrosion probe means with a surfactant for a sufficient period of time to render the dielectric surface ionically conductive when the corrosion probe means is inserted into a corrosive liquid environment containing a disperse phase having an ionically conductive solution.

4,840,720
PROCESS FOR MINIMIZING FOULING OF PROCESSING EQUIPMENT

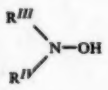
Dwight K. Reid, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 2, 1988, Ser. No. 240,775
Int. Cl.[4] C10G 9/16
U.S. Cl. 208—48 AA 21 Claims

1. A process for inhibiting the degradation, particulate and gum formation of distillate fuel oils prior to or during processing which comprises adding to the distillate fuel oil an effective inhibiting amount of a mixture of (a) a phosphite compound having the formula



wherein R, R' and R" are the same or different and are alkyl, aryl, alkaryl or aralkyl groups, and (b) an effective amount of hydroxylamine having the formula

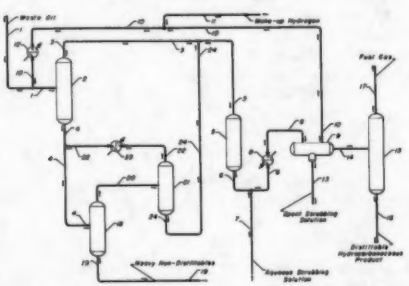


wherein R^{III} and R^{VI} are the same or different and are hydrogen, alkyl, alkaryl or arlkyl groups, wherein the weight ratio of (a):(b) is from about 1:10 to about 10:1.

4,840,721
PROCESS FOR TREATING A TEMPERATURE-SENSITIVE HYDROCARBONACEOUS STREAM CONTAINING A NON-DISTILLABLE COMPONENT TO PRODUCE A HYDROGENATED DISTILLABLE HYDROCARBONACEOUS PRODUCT

Tom N. Kalnes, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Mar. 16, 1988, Ser. No. 169,242
Int. Cl.[4] C10G 9/16, 34/00
U.S. Cl. 208—57 41 Claims



1. A process for treating a hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product and a heavy product comprising said non-distillable component while minimizing thermal degradation of said hydrocarbonaceous stream which process comprises the steps of:

(a) contacting said hydrocarbonaceous stream with a hot first hydrogen-rich gaseous stream having a temperature greater than said hydrocarbonaceous stream in a first flash zone at flash conditions including a first pressure thereby increasing the temperature of said hydrocarbonaceous stream and vaporizing at least a portion thereof to provide a first hydrocarbonaceous vapor stream comprising hydrogen and a first heavy product stream comprising said non-distillable component;

(b) contacting said first heavy product stream comprising said non-distillable component with a hot second hydrogen-rich gaseous stream in a second flash zone at flash conditions including a second pressure which is less than said first pressure of step (a) thereby vaporizing at least a portion thereof to provide a second hydrocarbonaceous vapor stream comprising hydrogen and a second heavy product stream comprising said non-distillable component;

(c) condensing at least a portion of said second hydrocarbonaceous vapor stream to provide a first liquid stream comprising distillable hydrocarbonaceous compounds;

(d) contacting said first hydrocarbonaceous vapor stream comprising hydrogen from step (a) and said first liquid stream comprising distillable hydrocarbonaceous compounds from step (c) with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions to increase the hydrogen content of the hydrocarbonaceous compounds introduced into said hydrogenation reaction zone;

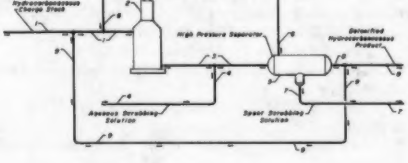
(e) condensing at least a portion of the resulting effluent from said hydrogenation reaction zone to provide a third hydrogen-rich gaseous stream and a liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds; and

(f) recovering a hydrogenated distillable hydrocarbonaceous product from said liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds.

4,840,722
NON-CATALYTIC PROCESS FOR THE CONVERSION OF A HYDROCARBONACEOUS STREAM CONTAINING HALOGENATED ORGANIC COMPOUNDS

Russell W. Johnson, Elmhurst, and Lee Hilfman, Mount Prospect, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Apr. 1, 1988, Ser. No. 176,504
Int. Cl.[4] C10G 45/02, 67/10
U.S. Cl. 208—95 10 Claims



5. A non-catalytic process for the conversion of a hydrocarbonaceous stream containing less than about 5 weight percent halogenated organic compounds which process consists essentially of

(a) reacting said hydrocarbonaceous stream in the presence of hydrogen in a reaction zone at reaction conditions including an elevated temperature selected to hydrogenate at least a portion of said halogenated organic compounds;

(b) contacting the reaction zone effluent with an aqueous scrubbing solution; and

(c) introducing a resulting admixture of said reaction zone

effluent and said aqueous scrubbing solution into a separation zone to provide a hydrocarbonaceous product stream containing lower halogen content and a spent aqueous stream.

4,840,723

HYDROCARBONS PYROLYSIS

Frederick D. Austin; John L. Barclay, both of Surrey, and James O. Hunter, Sunbury-on-Thames, all of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 946,575, Nov. 13, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 246,036

Claims priority, application United Kingdom, Mar. 28, 1985, 8508103

Int. Cl.[4] C01G 9/38

U.S. Cl. 208—106 9 Claims

1. A process for the pyrolysis of a liquid hydrocarbon feed boiling at a temperature above 350° C. which comprises introducing the hydrocarbon feed in the form of finely divided droplets into a hot gas which gas is at a pressure of not more than 1 MPa and which contains at least 65% volume of methane and not more than 10% volume hydrogen, the temperature of the reaction mixture into which the droplets are fed being in the range 600° C. to 1400° C. followed by reduction of the temperature of the reaction mixture to below 300° C. in less than 30 milliseconds, the proportion of steam in the hot gas being not more than 12% by volume.

4,840,724

PROCESS FOR CRACKING HYDROCARBON FEEDS

Cornelis J. Groenenboom, Driehuis, and Peter A. Wieringa, Naarden, both of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Continuation of Ser. No. 920,434, Oct. 20, 1986, abandoned. This application Jan. 12, 1989, Ser. No. 296,893

Claims priority, application Netherlands, Oct. 18, 1985, 8502851

Int. Cl.[4] C10G 11/05

U.S. Cl. 208—120 8 Claims

1. A cracking process comprising cracking a metal-free hydrocarbon feed in the presence of a fluidizable cracking catalyst composition containing a sepiolite, an ultrastable Y-zeolite, a clay selected from the group consisting of kaolin, bentonite, a layered clay and a montmorillonite clay, and a matrix material.

4,840,725

CONVERSION OF HIGH BOILING LIQUID ORGANIC MATERIALS TO LOWER BOILING MATERIALS

Stephen C. Paspek, North Royalton, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 19, 1987, Ser. No. 64,919

Int. Cl.[4] C10G 29/02, 35/02

U.S. Cl. 208—130 19 Claims

1. A process for converting high boiling hydrocarbons to lower boiling materials characterized by an increase in aromatic content and a lower pour point which comprises contacting said high boiling hydrocarbons with water at a temperature of from about 600° F. to about 875° F. at a pressure of at least about 2000 psi in the absence of any externally supplied catalysts, and wherein the weight ratio of water to high boiling hydrocarbons is from about 0.5:1 to about 0.7:1, and the water and high boiling hydrocarbon form a substantially single phase system under the elevated temperature and pressure conditions utilized.

4,840,726

METHOD FOR DETERMINING AND CONTROLLING THE AMOUNT OF FINELY DIVIDED PARTICULATE SOLIDS ADDED TO A STREAM OF FLUID

John J. Wakefield, Jr., Kingwood, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 932,852, Nov. 20, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 181,803

Int. Cl.[4] C10G 9/32

U.S. Cl. 208—152 12 Claims

1. A method for adding controlled quantities of finely divided particulate catalyst to a fluid catalyst cracking process, said method consisting essentially of:

(a) flowing a fluid through a transfer line to transfer said particulate catalyst to said process;

(b) adding said particulate catalyst to said transfer line at a selected rate and at a temperature different than the temperature of said fluid to produce a mixture of said particulate catalyst and said fluid in said transfer line;

(c) determining the temperature of said particulate catalyst prior to addition of said particulate catalyst to said transfer line;

(d) determining the temperature of said fluid flowing through said transfer line prior to addition of said particulate catalyst to said transfer line;

(e) determining the quantity of said fluid flowing through said transfer line;

(f) determining the heat capacity of said particulate catalyst and said fluid;

(g) determining the temperature of said mixture in said transfer line;

(h) calculating the amount of particulate catalyst in said mixture by the equation:

$$W_c=(W_a\times C_{pa}\times(T_a-T_{ac})/C_{pc}\times(T_{ac}-T_c))$$

where:

W_c equals the amount of particulate catalyst in said mixture,

W_a equals the amount of fluid flowing through said transfer line,

T_a equals the temperature of the fluid flowing through said transfer line prior to addition of said particulate catalyst to said transfer line,

T_c equals the temperature of the particulate catalyst added to said transfer line prior to addition of said particulate catalyst to said transfer line,

T_{ac} equals the temperature of the mixture flowing in said transfer line,

C_{pa} equals the heat capacity of the fluid flowing through said transfer line,

C_{pc} equals the heat capacity of the particulate catalyst added to said transfer line.

(i) controlling the rate of addition of said particulate catalyst to said transfer line to maintain a selected quantity of said particulate catalyst in said transfer line based upon said calculation.

4,840,727

DOUBLE BANK GRAIN CLEANER AND ASPIRATOR THEREFOR

Cecil T. Humphrey, 3744 Linwood St., Burnaby, Canada

Filed Dec. 20, 1982, Ser. No. 451,302

Claims priority, application Canada, Dec. 30, 1981, 393429

Int. Cl.[4] B07B 9/02, 7/01

U.S. Cl. 209—32 3 Claims

1. A double bank cleaning device for granular and like material comprising:

an outer, open frame of rectangular configuration having spaced end frames interconnected by upper and lower cross beams;

an inner frame suspended from said outer frame by universal joints thereby to allow said inner frame to move in a horizontal plane relative to said outer frame;

two spaced banks of cleaning decks mounted in and secured to said inner frame, said decks having infeed ends and outlet ends extending beyond the confines of the outer frame and adapted to convey granular material throughout their length; and

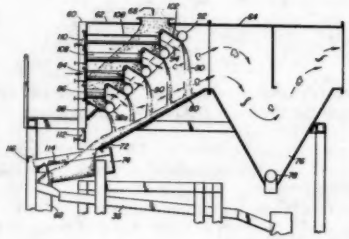
drive means mounted on said inner frame between said spaced banks of cleaning decks, said drive means comprising a box enclosure secured to the inner frame, a dead shaft vertically mounted in said box enclosure, an eccentric weight mounted for rotation in a horizontal plane on said dead shaft and motor means for rotating said weight thereby to impart a flat, rotary motion to said suspended inner frame and the double bank of cleaning decks secured therein; and including

a multi-feed aspirator for feeding granular material into said cleaning device, said aspirator comprising a housing mounted above said outer frame;

a plurality of horizontally disposed feed rolls mounted in said housing, one above and forward of the other, each roll feeding a curtain of granular material, by gravity, down through the housing and into said infeed ends of said decks, and a plurality of ducts directing air generally horizontally against said curtains of granular material to carry lighter-than-grain pieces into a drop out section.

2. An aspirator for mounting on top of a grain cleaning machine comprising:

a housing having an intake section and an exhaust section, said housing being adapted for connection to fan means for passing air through said housing from the intake to the exhaust sections;



said intake section having an inlet in its upper end for receiving granular material therein, and an outlet in its lower end for dropping granular material into cleaning decks of said cleaning machine;

baffle means dividing said intake section between its granular inlet and outlet and extending generally diagonally across said intake section;

means in said baffle means for metering granular material therethrough in a plurality of downwardly flowing curtains extending across said intake section; and

means for directing the air passing through the housing to impinge upon said downwardly flowing curtains thereby to carry material lighter than said granular material out of said intake section and into said exhaust section;

said baffle means comprising a stepped panel extending generally diagonally from one end wall of the intake section to the top wall thereof, said stepped panel having a series of vertical sections separated by horizontal sections, said metering means being located in the horizontal sections and the air directing means being located in the vertical sections;

said metering means comprises a plurality of feed rolls extending across said baffle means, each feed roll being located adjacent to and below said vertical and horizontal sections, and gate members in the horizontal sections in contact with the feed rolls for passing granular material through the baffle means, and drive means for rotating said feed rolls.

4,840,728

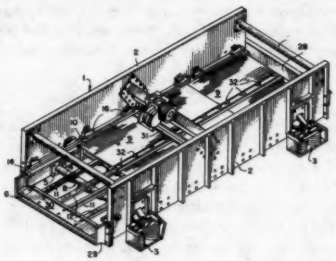
VIBRATING SCREENING APPARATUS

James D. Connolly, and Darrel Huff, both of Princeton, W. Va., assignors to Conn-Weld Industries, Inc., Princeton, W. Va.

Filed Mar. 14, 1988, Ser. No. 167,636

Int. Cl.[4] B07B *1/46*

U.S. Cl. 209—405 **11 Claims**



1. In vibrating screening apparatus having vibrating and screening means, the improvement comprising a frame having laterally spaced side plates, a plurality of cross-members extending transversely between said side plates, each cross-member having end plates welded to opposite ends thereof and being boltable through said end plates to said side plates, and a rigid spacer plate inserted between an end plate of each cross-member and an adjoining side plate and boltable with said end plate to said side plate.

4,840,729

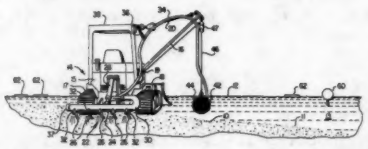
OIL SPILL RECOVERY APPARATUS

Robert A. Levine, Westminster, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 5, Jan. 2, 1987, Pat. No. 4,758,355. This application Feb. 12, 1988, Ser. No. 155,406

Int. Cl.[4] E02B *15/04*

U.S. Cl. 210—170 **2 Claims**



1. Apparatus for removing oleaginous substances such as crude oil or refined petroleum products from entrapment in coarse bottom sediments such as submerged sand beds covered by bodies of water or forming the bottom of a holding pond characterized by:

tractor means for traversing said sand bed in a pattern which will substantially cover the area in which said substances are entrapped, said tractor means including a movable boom for supporting pump means for withdrawing water from said body of water;

motor driven pump means supported by said boom spaced from said tractor means for intake of water from said body of water;

means mounted on said tractor means for mechanically plowing said sand bed to a depth sufficient to overturn

said sand bed which has been saturated with said substances; and

hydraulic jet nozzle means in communication with said pump means for discharging a high velocity flow stream of water adjacent to said means for plowing to agitate said overturned said to free said substances from the grains of sediment for flotation of said substances to the surface of said body of water.

4,840,730

CHROMATOGRAPHY SYSTEM USING HORIZONTAL FLOW COLUMNS

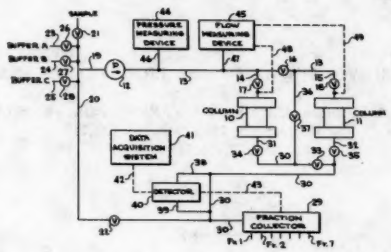
Vinit Saxena, Pinole, Calif., assignor to Sepragen Corporation, San Leandro, Calif.

Continuation of Ser. No. 889,335, Jul. 25, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 207,896

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **22 Claims**



1. A low pressure chromatography system using at least one horizontal column, said system comprising:

at least one chromatographic column having a bed of separation medium located intermediate an inlet channel and an outlet channel said inlet and outlet channels being coaxially positioned with respect to each other, said column being constructed such that sample fluid passes through said bed in a horizontal direction from said inlet channel to said outlet channel,

means for directing sample fluid to said column including pump means having an outlet connected via a first fluid line to an inlet of said column, said inlet being in fluid communication with said inlet channel, and valve means mounted in said first fluid line for controlling passage of fluid therethrough,

detection means connected to said column for detecting sample fluid fractions discharged from said outlet channel of said column, and

means for controlling at least sample fluid directed into said inlet of said column and sample fluid fractions discharged from said outlet channel of said column.

4,840,731

APPARAUS FOR REDUCTION OF COD IN WATER

Morris Sheikh, 803 Canterberry Crescent, Bloomfield Hills, Mich. 48013

Division of Ser. No. 746,041, Jun. 18, 1985, Pat. No. 4,683,065. This application Jul. 22, 1987, Ser. No. 76,312

Int. Cl.[4] C02F *1/74;* **B01J** *8/04*

U.S. Cl. 210—200 **21 Claims**

1. An apparatus for reducing chemical oxygen demand (COD) levels in water comprising:

a waste water holding tank;

a plurlaity of independent, individually isolatable reactors;

catalyst contained in a fixed bed within each reactor, the catalyst, selected from the group consisting of activated alumina, Group VIIIB metals, Group IIB metals, and mixtures thereof;

means for conveying the water from the waste water hodling tank to the respective reactor;

means for conveying at least one oxygen source to the water;

means for discharging water away from each reactor;

means for discharging water from the apparatus; and

means for regenerating the spent catalyst while the catalyst remains contained within each respective reactor, the regenerating means associated with each respective reactor.

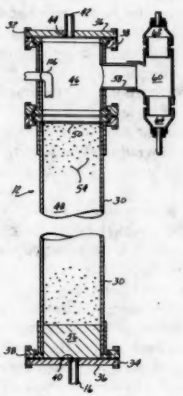
18. An apparatus for reducing levels of chemical contaminants in aqueous media comprising:

a holding tank for the aqueous media;

a plurality of independent, individually isolatable reactors capable of being in fluid communication with one another;

catalyst fixedly contained within each reactor, the catalyst selected from the group consisting of activated alumina, Group VIIIB metals, Group IIB metals and mixtures thereof;

means for conveying the aqueous media from the hodling tank to the reactor, the conveying means comprising:



(a) a main water pipe; and

(b) a plurality of main water pipe branch lines connected at a first end to the main water pipe and at a second end to the base of the associated reactor;

means for conveying at least one oxygen source to the aqueous media;

means for discharging the aqueous media from the reactor, the discharge means comprising:

(a) an exit pipe, having a first end affixed to and extending outward from the associated reactor;

(b) a divider ventricle in communication with a second end of the exit pipe, the divider ventricle having a gaseous collector dome above the junction with the exit pipe with a gaseous escape vent located therein and a liquid phase collector portion; and

(c) a return line connected to the liquid phase collector portion at a first end and connected to the main water pipe at a second end; and

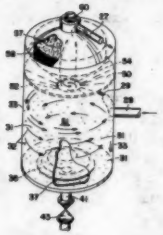
means for discharging the aqueous media from the apparatus.

4,840,732

FUEL TANK CLEANING SYSTEM

P. J. Thomas Rawlins, 216 Sena Dr., Metairie, La. 70005

Division of Ser. No. 899,071, Aug. 21, 1986, Pat. No. 4,772,401.
This application Aug. 25, 1988, Ser. No. 236,558
Int. Cl.[4] B01D *36/04*
U.S. Cl. 210—306 2 Claims



1. A vessel for separating solid contaminants and free water from contaminated fuel, the vessel comprising:

a. an annular wall portion, and top and bottom portions, together defining a vessel chamber therewithin;

b. an upper horizontal baffle member having a fluid flow bore therethrough, contained within the vessel chamber for separating the vessel chamber into a lower separator zone and an upper filtration zone;

c. inlet means for introducing contaminated fuel within the lower separator zone so that the fuel is circulated within the lower separator zone to cause larger contaminants and free water to move downward along the annular wall of the vessel chamber into a lower portion of the separator zone;

d. lower baffle means within the lower portion of the separator zone of the vessel chamber for preventing free water and contaminants that have settled within the lower portion of the separator zone from returning into an upper portion of the separator zone;

e. means within the lower portion of the separator zone of the vessel chamber for discharging the contaminants and free water that have settled therewithin;

f. a discharge line in the upper filtration zone for discharging fluid introduced into the vessel chamber;

g. a primary filter medium contained within the upper filtration zone of the vessel chamber above the upper baffle for filtering fluid being discharged from the discharge line of the vessel chamber; and

h. means within the tank portion for receiving discharged fuel from into the tank under such a velocity so as to create a turbulence of fuel, free water and contaminants within the tank.

4,840,733

FINE POROUS MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Jun Sasaki; Atsushi Adachi; Kyoichi Naruo; Yukio Shinagawa, and Sumio Ohtani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1987, Ser. No. 127,304
Claims priority, application Japan, Dec. 2, 1986, 61-285996; Dec. 2, 1986, 61-285997
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.41 6 Claims

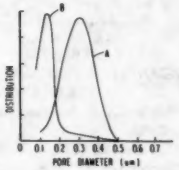
1. A fine porous membrane, comprising:

a polymer film having a top and a bottom surface defining an interior;

a plurality of pores distributed in said film in a thickness direction; and

a dense layer comprising a plurality of pores of minimum pore size located within said interior space,

means providing a ratio of the maximum pore size of the pores in the dense layer to the average pore size of the pores in the dense layer, of not more than 1.8,



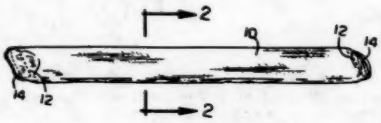
and means providing a pore size of the pores located at the bottom surface of the film of 10 to 1,000 times greater than the pore size of the pores located at the top surface of the film.

4,840,734

PROCESS FOR ABSORBING LIQUID LEAKS AND SPILLS

Edward R. Johnson, 306 Burk Ave., Ridley Park, Pa. 19078

Filed Nov. 25, 1987, Ser. No. 125,117
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—660 1 Claim



1. A method for absorbing acidic liquid leaks and spills, comprising:

contacting said acidic liquids with a product having at least one closed cell formed from an elongated tube having walls of an acid resistant fibrous material which is permeable to the acidic liquid, said tube having vermiculite in said tube as an absorbent in an amount sufficient to fill said tube to substantially restrict movement of individual vermiculite particles while permitting positioning of said tube, and end seams at both ends of said tube having inside end seams and outside end seams at both of said ends to contain said vermiculite therein;

and removing said product after a quantity of acidic liquid has been absorbed.

4,840,735

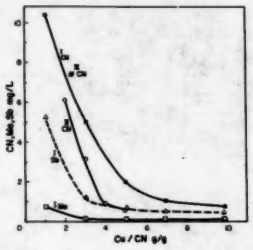
PROCESS FOR THE REMOVAL OF CYANIDE AND OTHER IMPURITIES FROM SOLUTION

Ernest Goodwin, Manitouwadge, Canada, assignor to Hemlo Gold Mines Inc., Toronto, Canada

Filed May 3, 1988, Ser. No. 189,806
Claims priority, application Canada, Jun. 23, 1987, 540430
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—721 11 Claims

1. A process for the removal of cyanide, molybdenum and antimony impurities from an aqueous solution comprising adding copper ion and ferrous ion as reagents to said solution while maintaining a pH of about 4 to 8 in said solution using lime, with a ratio of copper to cyanide in the range of 3:1 to

10:1 by weight in said solution and with a ratio of iron to copper of at least 0.3:1 by weight in said solution, forming a



precipitate including said impurities, and separating said precipitate from said aqueous solution.

4,840,736

PROCESS FOR PRODUCING COMBUSTIBLE SEWAGE SLUDGE FILTER CAKES IN FILTER PRESSES

Bruno Sander, Ludwigshafen; Herbert Lauer, Mutterstadt, and Manfred Neuwirth, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 320,681, Nov. 12, 1981, abandoned. This application Sep. 22, 1983, Ser. No. 534,681

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045120

Int. Cl.[4] C02F *11/14, 1/52*

U.S. Cl. 210—727 6 Claims

1. A process for producing combustible filter cakes from sewage sludges of which the sewage sludge solids contain less than 70% by weight of organic matter which comprises: concentrating the sewage sludges in the absence of lime by gravity sedimentation by adding a synthetic organic flocculant in amounts of from 0.5–2.0 kg/metric ton of sewage sludge solids from 0.5–5.0% by weight of sewage sludge solids to 6–14% by weight of sewage sludge solids; mixing the sewage sludges with finely divided coal or ash or mixtures thereof, in an amount of from 0.5 to 1.5 parts by weight per part by weight of sewage sludge solids;

treating the sewage sludges by mixing before, during or after adding finely divided coal or ash or mixtures thereof with a further amount of organic flocculants 2–8 kg/metric ton of sewage sludge solids to form flocs having high mechanical stability wherein said organic flocculants employed are mixtures, in a weight ratio of from 1:3 to 3:1 of a flocculant which is 30 to 40% by weight cationically modified and a flocculant which is 70–90% by weight cationically modified;

and thereafter dewatering the sewage sludges in a filter press to form sewage sludge - filter cakes which release satisfactorily for automatic ejection, have solids contents of 50–65% by weight, and which can be burnt without the addition of auxiliary fuel.

4,840,737

PROCESS FOR SEPARATING SOLID PARTICLES AND/OR LIQUID FROM A SUSPENSION AND WASH COLUMN

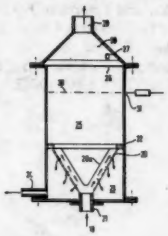
Percy C. Henriquez, Holten, Netherlands, assignor to Douwe Egberts Koninklijke Tabaks-fabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Feb. 24, 1987, Ser. No. 17,873

Claims priority, application Netherlands, Feb. 24, 1986, 8600461

Int. Cl.[4] B01D *23/24, 11/02*

U.S. Cl. 210—772 6 Claims



1. Process for separating solid particles from a liquid suspension and purifying or leaching solid particles in a column containing a compacted bed, which comprises the following steps:

supplying a liquid suspension to said column, while withdrawing liquid phase therefrom through a filter construction thus washing the compacted bed, the leading portion of said liquid phase forming a wash front, disintegrating the washed compacted bed and removing the product of this disintegration, the washfront in the compacted bed being moved between two extreme limits in the compacted bed, wherein introducing said liquid suspension in the column and adjusting the pressure below a maximum permissible pressure in the column, extracting an amount of liquid therefrom through said filter construction leaving a pseudo-liquid residue of solid particles, said residue accumulates and by so accumulating adopts a translatory movement in the axial direction of the column, and thereby passes through disintegration means in the column.

4,840,738

STABLE BIODEGRADABLE FABRIC SOFTENING COMPOSITIONS CONTAINING 2-HYDROXYPROPYL MONOESTER QUATERNIZED AMMONIUM SALTS

Frederick E. Hardy, Ponteland, United Kingdom, and Darlene R. Walley, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

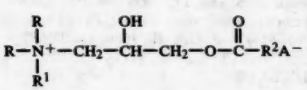
Filed Feb. 25, 1988, Ser. No. 160,380

Int. Cl.[4] D06M *00/00*; C11D *7/08*

U.S. Cl. 252—8.6 16 Claims

1. A liquid fabric softening and antistatic composition comprising:

(a) from about 1% to about 20% by weight of submicron-sized particles of a quaternized ester-ammonium softening compound having the formula



and mixtures thereof, wherein each R substituent is independently selected from C_1–C_6 alkyl or hydropxyalkyl groups, R^1 is a C_{14}–C_{22} hydrocarbyl group, R^2 is a

C_{13}–C_{21} hydroxycarbyl group, and A− is a softener compatible anion; and

(b) from about 60% to about 98% of a liquid carrier having said softening compound particles dispersed therein; said compositions being maintained at a pH ranging from about 2.0 to about 5.0 and further being substantially free of unprotonated amines.

4,840,739

ADHESIVE GREASE COMPOSITION COMPRISING A RANDOM COPOLYMER OF ETHYLENE AND AN ALPHA-OLEFIN

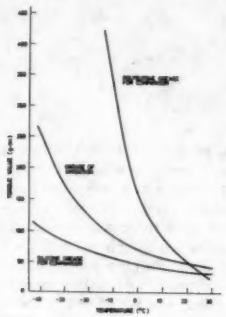
Shigeru Mori, Annaka, and Takayuki Takahashi, Gunma, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Mar. 16, 1988, Ser. No. 169,038

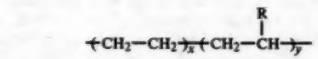
Claims priority, application Japan, Mar. 17, 1987, 62-60070

Int. Cl.[4] C10M *107/22*

U.S. Cl. 252—17 **11 Claims**



1. An adhesive grease composition which comprises: 100 parts by weight of a random copolymer of ethylene and an alpha-olefin having the following general formula



in which R represents an alkyl group having from 1 to 3 carbon atoms, and x and y are independently a positive integer provided that x/y=0.5 to 2.0 and x+y=50 to 150; and

from 5 to 100 parts by weight of a thickening agent for the grease composition.

4,840,740

GREASE FOR HOMOKINETIC JOINT

Tasuku Sato; Kiyoshi Nakanishi; Yoshikazu Fukumura, and Keizo Nagasawa, all of Iwata, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

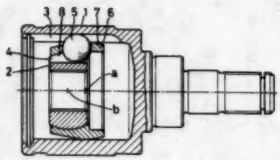
Continuation of Ser. No. 3,172, Jan. 14, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 233,862

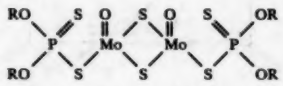
Claims priority, application Japan, Jan. 16, 1986, 61-8432; Apr. 25, 1986, 61-97615; Oct. 20, 1986, 61-250417

Int. Cl.[4] C10M *137/10, 115/08*

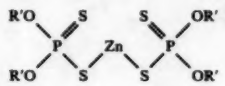
U.S. Cl. 252—32.7 E **8 Claims**

1. A grease for a homokinetic joint comprising a base oil, a thickening agent which is a urea compound and an organic molybdenum compound, in an amount of up to 10% by weight, selected from at least one compound from the group consisting of molybdenum dialkyl dithiocarbamate, molybdenum dialkyl dithiophosphate and molybdenum diaryl dithiophosphate of the formula:





wherein R represents a primary or secondary alkyl group or aryl group and an organic zinc compound selected from the group consisting of zinc dialkyl dithiophosphate, and zinc diaryl dithiophosphate of the formula:



wherein R′ represents a primary or secondary alkyl or aryl group, in an amount of up to 15% by weight.

4,840,741

ASHLESS ANTI-WEAR ADDITIVES

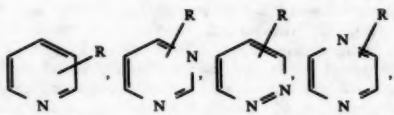
Morton Beltzer, Westfield, N.J., and Said Jahanmir, Germantown, Md., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 851,961, Apr. 14, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 85,799

Int. Cl.[4] C10M *133/40*

U.S. Cl. 252—47 **8 Claims**

1. A method for producing a lubricating oil having improved anti-wear properties, said method comprising admixing with a major amount of a basestock of lubricating viscosity from about 0.25 to about 2.0 weight percent of a compound selected from the group consisting of:



fused ring derivatives thereof and mixtures thereof, wherein R is one or more substituents selected from the group consisting of halogens, methyl cyano, cyano, isocyano, cyanato, isocyanato, thiocyanato, isothiocyanato, nitro, nitroso, formyl, acetyl, methoxy, methyl thio, thiol, disulfide, chloromethyl, dichloromethyl, trichloromethyl, chlorobromomethyl, nitromethyl, cyanomethyl and mixtures thereof.

4,840,742

SILICONE CONTAINING EMULSIONS AS BLADDER LUBRICANTS

Michael J. Hoffman, Clinton, Mich., assignor to Wacker Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 14,735, Feb. 13, 1987, abandoned. This application Nov. 6, 1987, Ser. No. 119,259
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] C10M *173/00, 155/02*
U.S. Cl. 252—49.5 14 Claims

1. An aqueous organopolysiloxane emulsion comprising (1) from 1 to 70 percent by weight of a hydroxyl-containing organopolysiloxane gum having a plasticity value of from 50 to 100 based on the weight of the organopolysiloxane emulsion; (2) from 0.1 to 25 percent by weight of an organohydrogenpolysiloxane fluid having a viscosity of from 5 to 100 mPa.s at 25° C., and an average of at least 2 Si-bonded hydrogen atoms per molecule, based on the weight of the organopolysiloxane emulsion; (3) from 0.05 to 40 percent by weight of a lubricant having a melting point of from 25 to 80° C., based on the organopolysiloxane emulsion; (4) from 0.1 to 20 percent by weight of mica, based on the weight of the organopolysiloxane emulsion; (5) from 2 to 12 percent by weight of a thickening agent, based on the weight of the organopolysiloxane emulsion; (6) from 1 to 10 percent by weight of a surfactant, based on the weight of the organopolysiloxane emulsion; and(7) from 10 to 90 percent by weight of water, based on the weight of the organopolysiloxane emulsion.

4,840,743

LIQUID ORGANOPOLYSILOXANE COMPOSITIONS

William Gardiner, Penarth, Wales, assignor to Dow Corning, Ltd., Barry, Wales

Filed Apr. 7, 1988, Ser. No. 179,463
Claims priority, application United Kingdom, Apr. 24, 1987, 8709745
Int. Cl.[4] C10M *105/76*
U.S. Cl. 252—49.6 6 Claims

1. An organopolysiloxane composition consisting essentially of (1) 100 parts by weight of a liquid polydiorganosiloxane wherein at least 70 percent of the total organic substituents are methyl groups, any remaining organic substituents being selected from the group consisting of alkyl groups having from 2 to 14 inclusive carbon atoms and phenyl groups, (2) from 0.01 to 7.5 parts by weight of an organosiloxane having at least one silicon-bonded group selected from the group consisting of anilinophenoxy and naphthylaminophenoxy groups and (3) a metal compound which is selected from the group consisting of (i) siloxy metal compounds having in the molecule at least one metal atom selected from the group consisting of titanium, zirconium and hafnium atoms attached to silicon via a TiOSi, ZrOSi or HfOSi linkage, and (ii) zirconium salts of monocarboxylic acids, there being sufficient of the metal compound present to provide from 0.001 to 0.25 part by weight of metal.

6. In an automobile fan clutch containing a viscous coupling fluid, the improvement comprising using as said coupling fluid a composition consisting essentially of (1) 100 parts by weight of a liquid polydiorganosiloxane wherein at least 70 percent of the total organic substituents are methyl groups, any remaining organic substituents being selected from the group consisting of alkyl groups having from 2 to 14 inclusive carbon atoms and phenyl groups, (2) from 0.01 to 7.5 parts by weight of an organosiloxane having at least one silicon-bonded group selected from the group consisting of anilinophenoxy and naphthylaminophenoxy groups and (3) a metal compound which is selected from the group consisting of (i) siloxy metal compounds having in the molecule at least one metal atom selected from the group consisting of titanium, zirconium and hafnium atoms attached to silicon via a TiOSi, ZrOSi or HfOSi linkage, and (ii) zirconium salts of monocarboxylic acids, there being sufficient of the metal compound present to provide from 0.001 to 0.25 part by weight of metal.

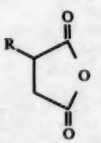
4,840,744

MODIFIED SUCCINIMIDES AND LUBRICATING OIL COMPOSITIONS CONTAINING THE SAME

Robert H. Wollenberg, San Rafael; Frank Plavac, Novato, and Timothy R. Erdman, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 90,187, Aug. 27, 1987, Pat. No. 4,746,446, which is a division of Ser. No. 864,166, May 16, 1986, which is a division of Ser. No. 722,939, Apr. 12, 1985, Pat. No. 4,612,132, which is a continuation-in-part of Ser. No. 632,777, Jul. 20, 1984, abandoned. This application Apr. 26, 1988, Ser. No. 186,512
Int. Cl.[4] C10M *133/44*
U.S. Cl. 252—51.5 A 43 Claims

1. A product prepared by the process which comprises reacting (a) a polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with a hydroxyhydrocarbyl oxycarbonyl wherein the hydroxyhydrocarbyl group of said hydroxyhydrocarbyl oxycarbonyl contains from 2 to 20 carbon atoms and 1 to 6 hydroxy groups with the proviso that there is no hydroxy substitution on the hydrocarbyl carbon atom attaching the hydroxyhydrocarbyl group to the oxy atom of the oxycarbonyl group and with the further proviso that when more than one hydroxy group is contained in the hydroxyhydrocarbyl group, no more than one hydroxy group is attached to the same carbon atom and the number of carbon atoms in the hydroxyhydrocarbyl group is minimally one greater than the number of hydroxy groups, with (b) an alkenyl or alkyl succinic anhydride of the formula:



wherein R is alkenyl or alkyl of from 10 to 300 carbon atoms and wherein the process employs from about 0.1 to 1.5 equivalents of the alkenyl or alkyl succinic anhydride per equivalent of the modified polyamino alkenyl or alkyl succinimide of (a) above.

4,840,745

FLUID COMPOSITION

Toshiyuki Tsubouchi; Kazuaki Abe, and Hitoshi Hata, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,412
Claims priority, application Japan, Nov. 21, 1986, 61-278307
Int. Cl.[4] C10M *105/04*
U.S. Cl. 252—73 6 Claims

1. In a traction drive containing a tractant, the improvement which comprises using as the tractant a fluid composition which contains a cis-o-tercyclohexyl compound and a trans-o-tercyclohexyl compound at a weight ratio within the range of 25:75 to 65:35.

4,840,746

LIQUID CLEANSER COMPOSITION CONTAINING AN ABRASIVE CRYSTALLINE ALUMINOSILICATE ZEOLITE AGGREGATE

Ryozi Shiozaki, Matsudo; Atsuhiko Kaji, Ichikai; Hiroyuki Saijo, and Katsuhiko Deguchi, both of Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 86,365
Claims priority, application Japan, Sep. 3, 1986, 61-207139; Sep. 3, 1986, 61-207140
Int. Cl.[4] C09G *1/02;* C11D *3/14, 9/20, 17/08*
U.S. Cl. 252—174.25 13 Claims

1. A liquid cleanser composition comprising from 1 to 20

percent by weight of a synthetic, organic surfactant, from 3 to 70 percent by weight of water-insoluble, synthetic, crystalline aluminosilicate zeolite abrasive particles each composed of an aggregate of at least 30 cubic aluminosilicate zeolite crystals penetrating into each other so that each particle has many corners, said crystalline aluminosilicate zeolite abrasive particles having an average particle size of 2 to 12 microns, said particles being dispersed in a liquid carrier.

4,840,747

METHOD FOR PRODUCING A TERBIUM ACTIVATED CERIUM MAGNESIUM ALUMINATE PHOSPHOR

Albert K. Fan; Douglas R. Ginter; Joseph J. Lenox, and Thomas L. Henson, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 23, 1988, Ser. No. 275,485

Int. Cl.[4] C09K *11/80*

U.S. Cl. 252—301.4 R **1 Claim**

1. A method for producing a terbium activated cerium magnesium aluminate phosphor, said method comprising:

(a) forming a uniform powder blend consisting essentially of in percent by weight from about 73 to about 74 aluminum oxide, wherein said aluminum oxide is selected from the group consisting of alpha aluminum oxide, gamma aluminum oxide, and combinations thereof, from about 12 to about 14 cerium oxide, a source of magnesium in an amount of from about 2 to about 3 magnesium, a source of fluoride in an amount of from about 0.3 to about 0.7 fluoride, and a source of terbium in an amount of from about 6 to about 9 terbium;

(b) firing said blend in a non-oxidizing atmosphere at a temperature of from about 1500° C. to about 1800° C. for a sufficient time to produce the phosphor wherein the particle size is no greater than about 5 micrometers in diameter;

(c) cooling said phosphor; and

(d) deaggmomerating the resulting cooled phosphor.

4,840,748

POLYALKANOLAMINES

Thomas J. Bellos, Kirkwood, and Eva G. Lovett, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 676,693, Nov. 20, 1984, Pat. No. 4,731,481, which is a division of Ser. No. 264,506, May 18, 1981, Pat. No. 4,505,839. This application Jun. 15, 1987, Ser. No. 62,290

Int. Cl.[4] B01D *17/00, 1/00*

U.S. Cl. 252—344 **7 Claims**

1. A process of demulsifying an oil-in-water emulsion which comprises adding to said emulsion from about one to about 200 parts per million, based on the volume of the emulsion of a composition comprisinig polyalkanolamines which polyalkanolamines have an osmometer molecular weight of from about 325 to 525, a viscosity of about 65 to 150 SUS at 50% aqueous solution by weight at 100° F. and which do not exhibit a peak at 46.6 ppm on ^{13}C nmr spectrum in D_2O and allowing the oil and water phases to separate.

5. In a process of beneficiating solids using a froth floatation system, the improvement which comprises adding to said system from about 0.5 to about 60 parts per million of a composition comprising polyalkanolamines and salts and quaternaries thereof, which polyalkanolamines have an osmometer molecular weight of from about 325 to 525, a viscosity of about 65 to 150 SUS at 50% aqueous solution by weight at 100° F. and which do not exhibit a peak at 46.6 ppm on ^{13}C NMR spectrum in D_2O.

4,840,749

PROCESS FOR PRODUCTION OF 1-AMINOANTHRAQUINONE

Noriaki Ikeda; Noboru Sugishima; Yasushi Fujii; Shinji Ikuta; Yoshiyuki Nakanishi, all of Himeji, and Akira Inoue, Hirakata, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 16, 1987, Ser. No. 62,638

Claims priority, application Japan, Jun. 17, 1986, 61-139311; Aug. 25, 1986, 61-197083; Jan. 6, 1987, 62-110; Jan. 6, 1987, 62-111

Int. Cl.[4] C07C *97/12*

U.S. Cl. 260—378 **10 Claims**

1. A process for producing 1-aminoanthraquinone, which comprises

(a) a step of oxidizing 1-nitronaphthalene in the liquid phase with an acidic aqueous solution containing a ceric ion, except aqueous sulfuric acid solution containing ceric sulfate, as an oxidizing agent and separating crystals containing 5-nitro-1,4-naphthoquinone and the acidic aqueous solution containing a cerium ion from the resulting reaction mixture,

(b) a step of subjecting the 5-nitro-1,4-naphthoquinone obtained in step (a) to Diels-Alder reaction with 1,3-butadiene in a solvent, precipitating crystals containing the resulting 5-nitro-1,4,4a,9a-tetrahydroanthraquinone, separating them by filtration, separating and recovering the unreacted 1-nitronaphthale and the solvent in the filtrate in a separation tower, and recycling 1-nitronaphthalene to step (a) for use as the starting material and re-using the recovered solvent for the Diels-Alder reaction,

(c) a step of reducing 5-nitro-1,4,4a,9a-tetrahydroanthraquinone obtained in step (b), separating crystals containing 1-aminoanthraquinone and purifying them, and

(d) a step of electrolytically oxidizing the acidic aqueous solution containing a cerium ion separated in step (a) to convert the cerous ion in the acidic aqueous solution to a ceric ion and recycling the resulting acidic aqueous solution containing a ceric ion to step (a) for re-use as the oxidizing agent.

4,840,750

CATALYTIC PROCESS FOR THE MANUFACTURE OF ACID FLUORIDE

Serge Delavarenne, Saint Germain En Laye; Michel Fauconet, St. Avold; Michel Simon, Harnes, and Jean Sommer, Strasbourg, all of France, assignors to Societe Chimique des Charbonnages S.A., Tour Aurore, France

Filed Nov. 16, 1987, Ser. No. 121,642

Claims priority, application France, Nov. 20, 1986, 86 16143; Feb. 19, 1987, 87 02140; Jul. 24, 1987, 87 10567

Int. Cl.[4] C07C *51/58*

U.S. Cl. 260—544 A **12 Claims**

1. A catalytic process for the manufacture of acid fluoride from carbon monoxide, hydrogen fluoride, and an aliphatic hydrocarbon stream consisting essentially of at least one alkane containing 3 to 4 carbon atoms, comprising the following sequential steps:

(a) introducing at least one fluid selected from the group consisting of carbon monoxide and said hydrocarbon stream into a reactor in the presence of a superacidic catalyst system consisting essentially of hydrogen fluoride and antimony pentafluoride,

(b) if it has not already been introduced during step (a), introducing into the reactor a fluid selected from the group consisting of carbon monoxide and said hydrocarbon stream, the reactor being at a temperature not above 60° C. permitting the formation, principally, of a complex consisting of the alkyloxocarbonium cation and the anion SbF_6^-

(c) converting said complex into acid fluoride,

(d) separating said acid fluoride, and

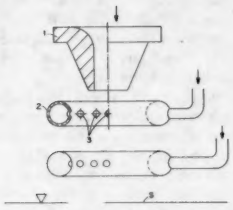
(e) recovering said superacidic catalyst system.

4,840,751

PROCESS FOR CONTACTING GASES WITH LIQUIDS

István Kenyeres, and Lehel Koch, both of Budapest, Hungary, assignors to Innofinance Általános Innovációs Pénzintézet, Budapest, Hungary

Filed Nov. 20, 1987, Ser. No. 123,228
Claims priority, application Hungary, Nov. 28, 1986, 4943/86
Int. Cl.[4] B01F 3/04
U.S. Cl. 261—36.1 4 Claims



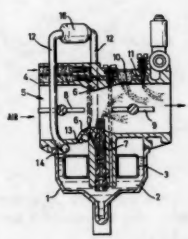
1. A process for contacting a gas with a liquid, comprising ejecting through a nozzle the liquid to be contacted in the form of a jet, through a space containing the gas to be contacted, and through the surface of the liquid to be contacted, and blowing at least a part of the gas, or at least a part of the liquid to be contacted, or both, onto the surface of the ejected liquid as streams of gas, or of liquid, or of both, through a partially enclosed annular space having a slot or a plurality of orifices substantially surrounding and facing the jet.

4,840,752

CARBURETTOR

Robert D. Glen, Forest Hill, Great Britain, assignor to E.P. Barrus Limited, Oxfordshire, United Kingdom

Filed Oct. 21, 1988, Ser. No. 260,736
Claims priority, application United Kingdom, Oct. 21, 1987, 8724612
Int. Cl.[4] F02M 5/02
U.S. Cl. 261—72.1 5 Claims



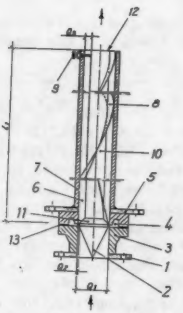
1. A carburettor, especially suitable for marine motors, of the type in which a supply of liquid fuel is held in a generally closed lower portion of a carburettor body, the lower portion being provided with inlets for air and outlets for fuel whereby fuel held therein is displaced in disseminated or vaporous form, into a main engine air supply passing through the upper part of the carburettor: in which an elongate duct means of capacity generally equivalent to said supply of liquid fuel is provided to communicate at each end with the said lower portion so that when the carburettor is inverted the said supply of liquid fuel drains into duct means under gravity, for re-use after like gravity drainage back into the lower portion when the carburettor is restored to its original orientation.

4,840,753

DEVICE FOR AERATING FLUIDS, IN PARTICULAR DURING FLOTATION

Andreas Jungmann, Essen, and Ulrich Reilard, Dorsten, both of Fed. Rep. of Germany, assignors to Allmineral Aufbereitungstechnik GmbH & Co. KG, Duisburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00665, § 371 Date Jul. 21, 1988, § 102(e) Date Jul. 21, 1988, PCT Pub. No. WO88/03838, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 4, 1987, Ser. No. 238,352
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640315
Int. Cl.[4] B01F 3/04
U.S. Cl. 261—76 13 Claims



1. A device for aerating fluids and embodied as a ring injector comprising:

a housing through which said fluid, in the form of a slurry, flows, with said housing having an inlet end, an outlet end, and air discharge opening means; and

a middle piece disposed in said housing in such a way that an annular channel is formed between said middle piece and said housing, with said middle piece having an end that is remote from said outlet end of said housing and that is embodied in such a way that at this location, where said annular channel communicates with said air discharge opening means of said housing, said annular channel increased suddenly, in the direction of flow of said slurry, from its narrowest gap width, which leads to a minimum slurry speed of 2.0 m/s, to a uniform cross-sectional area having a wide gap width that remains constant to said outlet end of said housing and that provides a mixing and dispersing section, the length of which is more than twenty times said constant wider gap width.

4,840,754

METHOD OF MOLDING ARTICLES

Harry C. Morgan, Pittsburgh, Pa., assignor to Ocutech, Pittsburgh, Pa.

Filed Nov. 9, 1987, Ser. No. 118,736
Int. Cl.[4] B29D 11/00
U.S. Cl. 264—2.2 11 Claims

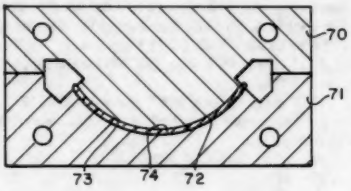
1. A method for molding an article, the method including the steps of:

providing a mold having separable molding surfaces;

loading a predetermined quantity of moldable material on at least one molding surface of the mold;

positioning the molding surfaces of the mold into a spaced apart relation to establish a meniscus of moldable material in the gap about the periphery of the moldable material;

causing said meniscus to attain a convex curvature extending outwardly of the gap between the molding surfaces; and



finalizing the molding of the moldable material to form the article while maintaining said meniscus with a convex curvature.

4,840,755

METHOD OF AND APPARATUS FOR PRODUCING COMPACTED CHOPPED STRANDS

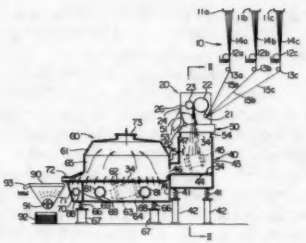
Kogi Nakazawa, and Toshihito Fujita, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 895,587, Aug. 13, 1986, abandoned, which is a continuation of Ser. No. 647,855, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 426,199, Sep. 28, 1982, abandoned. This application Sep. 14, 1988, Ser. No. 245,932

Claims priority, application Japan, Nov. 27, 1981, 56-190162; Feb. 12, 1982, 57-20711; Mar. 19, 1982, 57-43900

Int. Cl.[4] C03B *37/01*

U.S. Cl. 264—15 **16 Claims**



1. A method of producing compacted chopped strands having a high density comprising: cutting wetted strands with a cutting blade to prepare flattened chopped strands; subjecting said flattened chopped strands in a wetted state to a spheroidizing action until the flattened chopped strands are changed into compacted rod-shaped chopped strands having substantially circular cross-section; supplying said compacted chopped strands to one end of a vibrating carrier plate provided with a multiplicity of small perforations; conveying said chopped strands in the form of flowing bed thereof toward another end of said carrier plate while vibrating said chopped strands; applying heated gas to said flowing bed of chopped strands from the lower side of said carrier plate so that said heated gas flows through said flowing bed, thereby drying said chopped strands and removing fine filaments contained in said flowing bed; recirculating said heated gas which has passed through said flowing bed to the lower side of said carrier plate; and separating fine filaments from said heated gas being recirculated.

10. An apparatus for producing compacted chopped strands having a high density comprising:

means for cutting wetted strands with a cutting blade so as to form flattened chopped strands;

a rolling apparatus having an inlet for receiving wetted, flattened chopped strands; a spheroidizing means for imparting spheroidizing action to said wetted chopped strands until the flattened chopped strands are changed into compacted rod-shaped chopped strands having substantially circular cross-section; and an outlet for discharging the treated chopped strands;

drying means adapted to receive and dry said chopped strands coming from said rolling means having a casing provided at one end with an inlet for said chopped strands and at the other end an outlet for said chopped strands; a flow settling plate disposed in said casing substantially horizontally between said one end and said other end and provided with a multiplicity of small perforations, said flow settling plate dividing the space in said casing into at least one gas supplying chamber below and a gas discharging chamber above; and a vibrating means for vibrating said flow settling plate such that said chopped strands supplied through said inlet are moved toward said outlet;

means for supplying a heated gas into said gas supplying chamber so that said heated gas flows upwardly through the perforations in said perforated flow settling plate and then through said flowing bed of said chopped strands;

a gas discharging means for discharging gas from said gas discharging chamber;

a gas recirculating means for recirculating heated gas discharged from said gas discharging chamber to said gas supplying chamber; and

means provided in said gas recirculating means for separating fine filaments from said heated gas being recirculated.

4,840,756

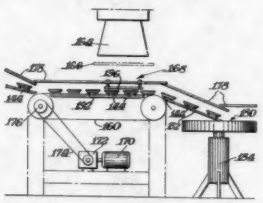
RADIATION PROCESS FOR PREPARATION OF ELECTROPHORESIS GEL MATERIAL

Richard C. Ebersole, Wilmington, and Robert P. Foss, Hockessin, both of Del., assignors to E. I. Du Pont Nemours and Company, Wilmington, Del.

Division of Ser. No. 604,586, Apr. 27, 1984, Pat. No. 4,704,198. This application Nov. 7, 1986, Ser. No. 928,154

Int. Cl.[4] C08F *2/54, 20/56;* B29C *35/08, 39/06*

U.S. Cl. 264—22 **13 Claims**



1. A process for preparing a thin porous gel product having a volume with length and width dimensions useful for electrophoretic separation by the steps of:

forming a water solution of a mixture of from about 3% weight/volume to about 30% weight/volume of acrylamide and/or other water soluble monomers which can undergo radical initiated polymerization and a cross-linking agent, the cross-linking agent comprising about 0.1% weight/weight to about 10% weight/weight of the total monomer.

adding a buffer to maintain pH and detergent, solutes, ampholytes or other materials to the solution which may be needed to maintain uniform electrophoretic migration.

forming the solution into the shape of the desired gel product having a uniform atomic composition throughout the volume.

subjecting the formed solution to ionizing radiation to polymerize and cross-link the monomer solutions, and

regulating the dose of ionizing radiation applied to the monomer solution to vary porosity of the resulting gel product as a function of the length and width of the gel.

4,840,757

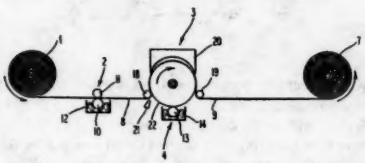
REPLICATING PROCESS FOR INTERFERENCE PATTERNS

Gary P. Blenkhorn, Cape Elizabeth, Me., assignor to S. D. Warren Company, Westbrook, Me.

Filed May 19, 1987, Ser. No. 51,891

Int. Cl.[4] B29D *17/00*

U.S. Cl. 264—22 **1 Claim**



1. In a method of forming a plastic film or sheet on or against a release sheet with a pattern, setting the film or sheet, and stripping the set film or sheet from the release sheet to leave the pattern replicated in the film or sheet, the improvement wherein the release sheet comprises a substrate having on at least one side thereof a coating of a radiation curable composition or material which has been cured by radiation, the outer surface of the coating having a light wave interfernce pattern having a peak to valley definition of or less than 7,000 angstroms formed by curing the coating in intimate contact with a replicating surface having the interference pattern.

4,840,758

METHODS OF PREPARING MOLDED THERMOPLASTIC ARTICLES WHEREIN RADIO FREQUENCY ENERGY IS UTILIZED TO HEAT THE THERMOPLASTIC MATERIAL

Agmund K. Thorsrud, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 9, 1988, Ser. No. 242,550

Int. Cl.[4] B29C *35/12, 43/00, 67/22*

U.S. Cl. 264—26 **25 Claims**

1. A method of preparing a molded thermoplastic article comprising the steps of:

(a) admixing a radio frequency energy sensitizing agent comprised of N-ethyl toluenesulfonamide with a thermoplastic polymer;

(b) applying radio frequency energy to the mixture formed in step (a) for a time sufficient to produce a moldable consistency in said mixture; and

(c) compression molding said mixture to produce a molded article therefrom.

4,840,759

ISOPENTANE AS BLOWING AGENT TO IMPROVE COFFEE RETENTION IN FOAM CUPS MOLDED FROM EXPANDABLE POLYSTYRENE

Paul E. Arch, Wayne, and Edwin H. Niemann, Downington, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Division of Ser. No. 184,926, Apr. 25, 1988. This application Oct. 11, 1988, Ser. No. 255,679

Int. Cl.[4] C08J *9/16, 9/18*

U.S. Cl. 264—53 **3 Claims**

1. A method for enhancing the coffee retention of molded foam cups made from vinyl aromatic polymer particles which have been impregnated with a blowing agent which method consists of adding an effective amount of isopentane as a portion of the blowing agent into the polymer particles and thereafter forming and molding said particles in the shape of a cup.

4,840,760

MANUFACTURING METHOD FOR MAGNETIC TAPE CASSETTE

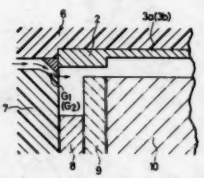
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1988, Ser. No. 149,321

Claims priority, application Japan, Jan. 28, 1987, 62-16202

Int. Cl.[4] B29C *45/04, 45/16*

U.S. Cl. 264—245 **3 Claims**



1. A method of manufacturing a magnetic tape cassette, by using a molding die comprising a fixed part and a second part including a submarine gate and a plurality of movable cores, said method comprising the steps of;

defining an initial cavity in said molding die between said fixed part and said moveable cores, said cavity having a specific size for forming a body of said cassette;

filling a molten plastic for molding said body of said cassette into said initial cavity in said molding die;

selectively moving said coles to define new cavities for at least two windows, said windows being separated by an intermediate portion of said cassette body and formed in the longitudinal direction thereof, said cavities being connected to said submarine gate; and

injecting a molten optically-transmissive plastic into said new cavities in the molding die through the submarine gate in a longitudinal direction along said intermediate portion already molded from the other plastic whereby pressure of said optically-transmissive plastic is lower than flow pressure of said other plastic; and

flow of said optically-transmissive plastic is in said longitudinal direction, so that deformation of said intermediate portion due to stress is prevented during said filling of said new cavities.

4,840,761

PROCESS FOR MAKING ENCAPSULATED ANCHOR RUNG

Heinrich Zenhausern, Birmensdorferstrasse 134A CH-8902, Urdorf/Zurich, Switzerland, and Robert Weber, Oakville, Canada, assignors to Heinrich Zenhausern, Urdorf/Zurich, Switzerland

Filed Feb. 20, 1987, Ser. No. 16,870

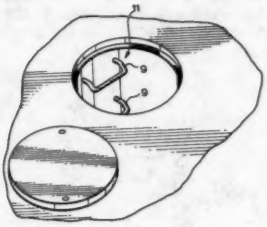
Claims priority, application Canada, Apr. 8, 1986, 506119

Int. Cl.[4] B29C *45/14*

U.S. Cl. 264—254 **5 Claims**

1. An improved method of manufacturing a climbing rung in a mould body having an ejection half and an injection half, the climbing rung having a generally U-shaped core of two parallel legs spaced apart by a central tread encapsulated in a protective coating comprising the combination in a sealing interface of a pair of pre-formed protective sleves and an injection moulded protective coating, the method comprising the steps of (a) sheathing the end of each leg in a pre-formed protective sleeve open at one end to receive the leg; (b) gripping the preformed protective sleeves with means for gripping the climbing rung only proximate the end of each leg; (c) position-

ing with the gripping means the tread and legs of the climbing rung extending only to proximate the receptive end of each pre-formed protective sleeve centrally in a disjointed injection mould cavity; (d) closing the ejection half and the injection half of the mould body so as to form the mould cavity enclosing the tread and legs of the climbing rung extending only to proximate the receptive end of each pre-formed protective sleeve, the mould body forming an annular seal at the outside



circumference of each pre-formed protective sleeve proximate the receptive end; (e) injecting a molten thermoplastic material into the mould cavity whereby the material flows into the entire mould cavity evenly coating the core of the climbing rung and weeping into the interface at the receptive end of each pre-formed sleeve and each leg, whereby the injected thermoplastic material melds with the pre-formed protective sleeves to form a sealing interface.

4,840,762

PROCESS FOR PREPARATION OF HIGH-PERFORMANCE GRADE CARBON FIBERS

Toru Sawaki; Hideharu Sasaki, both of Iwakuni; Tsutomu Nakamura, Kuga, and Jiro Sadanobu, Iwakuni, all of Japan, assignors to Teijin Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 690,624, Jan. 11, 1985, abandoned. This application Oct. 22, 1985, Ser. No. 790,102

Claims priority, application Japan, Jan. 24, 1984, 59-9454; Jul. 31, 1985, 60-167466; Jul. 31, 1985, 60-167467

Int. Cl.[4] D01F *9/14*

U.S. Cl. 264—29.2 **8 Claims**

1. A process for the preparation of high-performance grade carbon fibers, which process comprises attaching a fine powder of at least one member selected from the group consisting of oxides and carbides of silicon, aluminum, titanium, and boron to a precursor fiber bundle of as-spun pitch fibers, subjecting the fiber bundle to an infusibilization treatment, and subjecting the fiber bundle to a carbonization treatment, wherein the fine powder is attached to the precursor fiber bundle in an amount of 0.1 to 3% by weight based on the weight of the fibers, such that fusion bonding of the fibers in the bundle during infusibilization is substantially prevented without degrading the strength and elongation characteristics of the resulting carbon fibers.

4,840,763

METHOD FOR THE PRODUCTION OF REINFORCED COMPOSITES

Douglas W. Freitag, Arlington, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 6, 1987, Ser. No. 82,433

Int. Cl.[4] C04B *33/28*

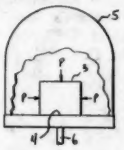
U.S. Cl. 264—65 **41 Claims**

1. In a method for producing a whisker reinforced refractory composite, the steps comprising:

(a) forming a suspension in a carrier liquid of a mixture of particulate materials comprising a colloidal refractory matrix powder, a colloidal sintering aid and refractory reinforcing whiskers;

(b) conforming said suspension to a desired configuration and into contact with a semi-permeable membrane;

(c) retaining said suspension in said configuration while imposing a pressure on said suspension to expel liquid from said suspension through said membrane to arrive at a green composite shaped in said desired configuration and



having a density equal to at least 40% of the theoretical density of said composite;

(d) drying said green composite; and

(e) thereafter sintering said shaped dried composite under an nonoxidative atmosphere at a temperature sufficient to form an intergranular liquid phase in said composite.

4,840,764

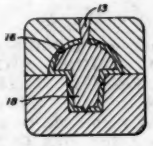
CONTROLLED WALL CASTING PROCESS

Richard F. Cummins, 941 Alabama, Lawrence, Kans. 66044

Filed Oct. 12, 1988, Ser. No. 256,633

Int. Cl.[4] B29C *39/18*

U.S. Cl. 264—102 **20 Claims**



1. A method for forming a cast replica of an article, comprising the steps of:

forming an outer mold around said article with a first molding material, said outer mold having an inner surface substantially conforming to the outer surface of said article;

separating said article from said outer mold;

applying to said outer mold on its inner surface a predetermined thickness of a second molding material which is separable from said outer mold, said second molding material defining a hollow space at the interior thereof;

filling the hollow space with a third molding material separable from said second molding material;

allowing said third molding material to cure to form an inner mold;

separating said second molding material from said outer mold and said inner mold;

locating said inner mold or a reproduction thereof within said outer mold with a space between said outer mold and said inner mold or reproduction representing said predetermined thickness;

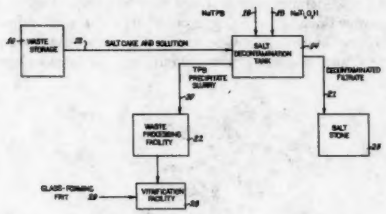
filling the space between said inner mold or reproduction and said outer mold with a fourth molding material;

allowing said fourth molding material to cure, forming said cast replica, and separating said cast replica from said outer mold.

4,840,765
PRECIPITATE HYDROLYSIS PROCESS FOR THE REMOVAL OF ORGANIC COMPOUNDS FROM NUCLEAR WASTE SLURRIES

Joseph P. Doherty, Elkton, Md., and James C. Marek, Augusta, Ga., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 25, 1987, Ser. No. 18,389
Int. Cl.[4] G21F *9/14*
U.S. Cl. 376—310 **26 Claims**

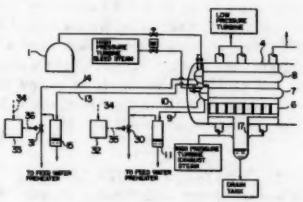


1. A process for removing organic compounds from a radioactive waste precipitate slurry, comprising hydrolyzing said slurry with an acid in the presence of a catalytically effective amount of a copper catalyst comprising copper (II) cations and separating the resulting hydrolyzed organic compounds.

4,840,766
METHOD OF AND APPARATUS FOR CONTROLLING STEAM VENT VOLUME OF MOISTURE SEPARATOR REHEATERS

Shozo Nakamura, Hitachiota; Tokunori Mathusima, Ibaraki, and Kunio Tsuji, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,242
Claims priority, application Japan, Oct. 26, 1982, 57-186871
Int. Cl.[4] G21D *3/00*
U.S. Cl. 376—378 **4 Claims**



1. A method of controlling the flow rate of steam of moisture separator reheaters of a nuclear power plant, comprising the steps of:

mounting a control valve in a steam vent line of a moisture separator reheater to effect control of the flow rate of the vent steam in conformity with the loud applied to the plant, storing information in a function generator on the functional relationship between loads applied to the plant and openings of the control valve, providing a signal to the function generator corresponding to a load applied to the plant, and providing a command signal to the control valve for adjusting the control valve opening, to thereby avoid the occurrence of an instable flow phenomenon in the entire range of loads applied to the plant.

3. In a nuclear power plant, an apparatus for controlling the flow rate of vent steam moisture separator reheaters having a drain water discharging line and a vent steam discharging line comprising:

a control valve mounted in a vent steam line of a moisture separator reheater to effect control of the flow rate of the vent steam in conformity with the load applied to the plant, and a function generator means for storing information on the functional relation between the loads applied to the plant and openings of the control valve, said function generator means producing an output signal to control the control valve.

4,840,767
METHOD OF MAKING A CATHODE FROM TUNGSTEN AND IRIDIUM POWDERS USING A BARIUM IRIDIATE FORMED FROM BARIUM PEROXIDE AND IRIDIUM OXIDE AS THE IMPREGNANT

Louis E. Branovich, Howell Township, Monmouth County; Gerard L. Freeman, Freehold Township, Monmouth County; Bernard Smith, Ocean, and Donald W. Eckart, Wall Township, Monmouth County, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1988, Ser. No. 252,945
Int. Cl.[4] G22F *3/26*
U.S. Cl. 419—27 **8 Claims**

1. Method of making a cathode for operation in microwave devices from tungsten and iridium powders using a barium iridiate formed from barium peroxide and iridium oxide as the impregnant, said method including the steps of:

(A) mixing the tungsten and iridium powders,
(B) adding about 2 percent by weight of an activator to the mixture,
(C) ball milling the mixture for about 8 hours,
(D) pressing the ball milled mixture into a billet at about 48,000 psi in a die,
(E) sintering the billet at about 1800° C. for about thirty minutes in dry hydrogen of less than −100 dewpoint,
(F) backfilling the billet with copper in dry hydrogen at about 1500° C.,
(G) machining the billet to the desired geometry,
(H) removing the copper by etching in nitric acid,
(I) thoroughly rinsing in deionized water, methanol and then drying,
(J) firing the billet in dry hydrogen at about 1400° C. for about 15 minutes,
(K) impregnating the billet with a barium iridiate formed in situ from reacting barium peroxide (BaO_2) with iridium oxide (IrO_2) by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,
(L) removing the billet from the furnace after the furnace is cooled, and
(M) removing any loose pieces of impregnant from the billet.

4,840,768
AUSTENITIC FE-CR-NI ALLOY DESIGNED FOR OIL COUNTRY TUBULAR PRODUCTS

Henry A. Domian; Dale F. LaCount, both of Alliance; Alex S. Miller, Poland, all of Ohio, and Kenneth D. Seibert, Hemet, Calif., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 14, 1988, Ser. No. 270,142
Int. Cl.[4] C22C *30/02*
U.S. Cl. 420—582 **3 Claims**

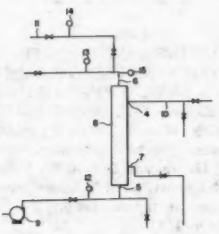
1. An austenitic alloy having high strength galling resistance, and corrosion resistance under stress consisting essentially of, in weight percent; 27–32 Ni; 24–28 Cr; 1.25–3.0 Cu; 1.0–3.0 Mo; 1.5–2.75 Si; 1.0–2.0 Mn; with no more than 0.015 N, 0.10 each of B, V and C, 0.30 A1, 0.03 P and 0.02 S; the balance being Fe and incidental impurities.

4,840,769

PROCESS FOR STERILIZING A FILTRATION DEVICE

Tatuo Nejigaki, and Yoshimi Kakutani, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 850,610
Claims priority, application Japan, Apr. 18, 1985, 60-81347; Apr. 18, 1985, 60-81348; May 21, 1985, 60-107063
Int. Cl.[4] A61C 2/06
U.S. Cl. 422—26 5 Claims



1. A process for sterilizing a filtration device containing residual raw water and filtrate and having a raw water side and a filtrate side and which employs therein a hollow, fiber type filtration module comprising hollow fibers disposed in a module case, said hollow fibers having end portions which are fixed in said module case by a sealing material, said hollow fibers being made of a heat resistant polymer with a heat distortion temperature of 70° C. or higher under a load of 18.6 kg/cm^2 and containing a pore diameter of less than 0.45 μm and the sealing material having a diference in the average linear expansion coefficient between it and the material of the module case of 7×10^{-5}/°C. or lower, at a temperature of 20°-121° C., which comprises

(i) discontinuing filtration,

(ii) passing sterilizing steam from the raw water side of the module to the filtrate side thereof, after pushing out the raw water from the raw water inlet of the module and filtrate from the module, with said sterilizing steam and

(iii) preventing the filtrate side of the filtration device from developing a negative pressure by introducing a fluid selected from the group consisting of water and a sterilized gas into the filtration device from a raw water side during the natural cooling which takes place after the steam sterilization has been completed.

4,840,770

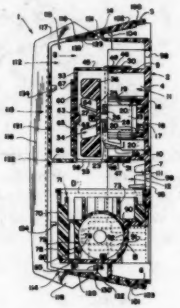
ODOR CONTROL PRODUCT DISPENSER

David K. Walz, Stone Mountain; Robert D. Howerton, Decatur, both of Ga.; Andrew W. Allen, East Jordan, Mich.; Thera C. Moss, and William H. Kenney, both of Cleveland, Tenn., assignors to SECO Industries, Inc., Cleveland, Tenn.

Filed Feb. 24, 1987, Ser. No. 17,542
Int. Cl.[4] A61L 9/12
U.S. Cl. 422—49 45 Claims

1. Odor control product dispenser apparatus comprising a cabinet including a first compartment containing a centrifugal fan and motor, a second compartment juxtaposed to said first compartment and containing a disposable container means, first and second vent means for respectively venting said first and second compartments to the atmosphere, a shroud surrounding said fan, said shroud having axial inlet openings through which air is drawn by said fan through said first vent means and radial discharge opening means through which air is forced radially outwardly by said fan into said second compartment for flow past the disposable container means in said second compartment and discharged through said second vent means, said disposable container means having a well in one end containing odor control product means, said well having an open top exposing said odor control product means to the air flowing through said second compartment, and support means within said second compartment for supporting said container means with said open top of said well facing said radial discharge opening means and in substantial axial alignment therewith, whereby substantially all of the air entering said second compartment through said radial discharge opening means flows past said odor control product means prior to being discharged through said second vent means.

12. Odor control product dispenser apparatus comprising a cabinet including a back wall having a partition extending forwardly therefrom intermediate the length of said back wall dividing said cabinet into first and second compartments, said first compartment containing a centrifugal fan and motor assembly, first and second vent means for respectively venting said first and second compartments to the atmosphere, a



shroud surrounding said fan, said shroud having axial inlet openings through which air is drawn by said fan through said first vent means and radial discharge opening means for directing substantially all of the air that is forced radially outwardly by said fan into said second compartment, support means within said second compartment for supporting odor control product means for exposure to the air flowing through said second compartment prior to discharge through said second vent means, said cabinet including an open front, and a front cover extending over said open front said first and second vent means comprising a grill on said front cover for venting said first and second compartments to the atmosphere through said grill said grill being removable from said front cover, and means on said grill and front cover providing a snap connection between said grill and front cover to permit attachment and removal of said grill without the use of any tools.

4,840,771

INCUBATOR FOR REAGENTS

Edward Williamson, Dover, and Stanley Pfeiffer, Mendham, both of N.J., assignors to Becton Dickinson & Company, Franklin Lakes, N.J.

Filed Sep. 22, 1986, Ser. No. 910,125
Int. Cl.[4] B01L 7/00, 9/00, 11/00
U.S. Cl. 422—104 13 Claims

1. An apparatus for heating at least one container, said apparatus comprising:

a housing;

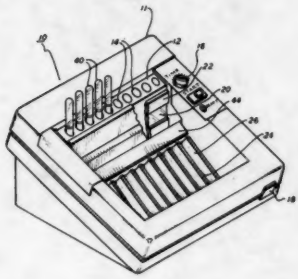
a block including a plurality of openings for holding containers;

means for pivotably securing the block to said housing, whereby the block is pivotable between an upright position in which containers are supported in the block and a downwardly inclined position in which containers spill out of the block;

drive means drivingly connected to said block to pivotably move the block from an upright position to a downwardly inclined position and back to an upright position;

heating means for heating containers in the block; and

control means for automatically actuating said drive means after a pre-set time to pivot said block to said downwardly



inclined position, whereby containers automatically spill out of the block and heating of containers is stopped without shutting down of the heating means.

4,840,772

ANTIGLAUCOMA COMPOSITIONS AND METHODS

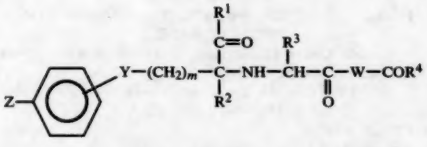
Robert Watkins, Great Meadows; Ronald J. Doll, Maplewood; Bernard R. Neustadt, West Orange; Elizabeth M. Smith; Charles V. Magatti, both of Verona, and Elijah H. Gold, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 849,072, Apr. 4, 1986, Pat. No. 4,783,444, which is a continuation of Ser. No. 651,378, Sep. 17, 1984, Pat. No. 4,584,285, which is a continuation of Ser. No. 500,494, Jun. 2, 1983, abandoned. This application Aug. 3, 1988, Ser. No. 227,954

Int. Cl.[4] G01N *31/22*

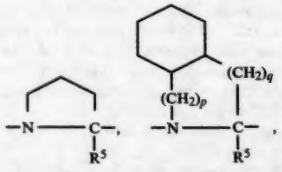
U.S. Cl. 422—61 **8 Claims**

4. A kit comprising in separate containers in a single package pharmaceutical compositions for use in combination to reduce intraocular pressure, which comprises in one container a pharmaceutical composition comprising an intraocular pressure reducing amount of a compound of formula I or a pharmaceutically and ophthalmologically acceptable salt thereof



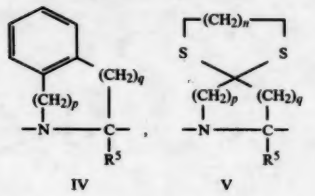
I

in combination with an ophthalmologically acceptable carrier for topical use, wherein W is



II III

-continued



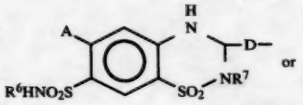
IV V

n is 0 or 1; m is 0 to 2;

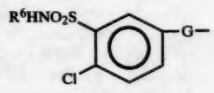
p and q are each 0, 1 or 2, provided that the sum of p and q is 1 or 2, and that in formula V, p is not 0;

Y is $—CH_2—$, $—CH_2O—$, or $—CH_2S—$, attached at the 2 or 4 position of phenyl group;

Z is



VI



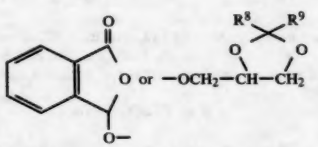
VII

wherein A is Cl or CF_3;

D is $—(CH_2)_u—$, wherein u is 1 or 2, $—CH_2O—$, $—CH_2S—$,

G is $—CONR^7(CH_2)_t—$, or $—SO_2NR^7(CH_2)_t—$; t is 0 or 1;

R^1 and R^4 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, $K—X_r—(CH_2)_s—O—$, wherein K is phenyl, substituted phenyl, 1- or 2-naphthyl, X is oxygen or sulfur, r is 0 or 1 and s is 0 to 4, provided that when s is 0, r is 0 and wherein the substituents on the phenyl are chosen from group M, wherein M is halogen, hydroxy, trifluoromethyl, alkoxy having 1 to 6 carbon atoms, 2- and 3-furanyl, 2- and 3-thienyl, phenyl, phenyl substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having from 1 to 6 carbon atoms, $—OCH_2OCO—$alkyl wherein the alkyl has from 3 to 8 carbon atoms, $—OCH_2CO—$phenyl, wherein the phenyl is phenyl or phenyl substituted with group M, 1-glyceryl,



R^2, R^5, R^6 and R^9 are hydrogen or lower alkyl;

R^3 is hydrogen, lower alkyl or amino lower alkyl;

R^7 is hydrogen, lower alkyl or phenyl(lower)alkyl; and

R^8 is hydrogen, lower alkyl, phenyl, or phenyl substituted by group M; and

in a second container, a pharmaceutical composition comprising an intraocular pressure reducing amount of a beta adrenergic blocking agent in a topical ophthamologically acceptable carrier.

4,840,773

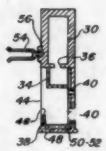
DEODORANT DISPENSER

Leonard Wade, 11215 Cornish St., Lynwood, Calif. 90262

Filed Aug. 5, 1988, Ser. No. 229,002

Int. Cl.[4] B60H *3/00*

U.S. Cl. 422—124 **12 Claims**



1. A liquid scent deodorant dispenser for utilization within a forced airstream comprising:

(a) a structural body having a front, rear, sides, top, and bottom, formed of non-porous material, with sufficient integrity to confine a liquid;

(b) said body having a fill cavity with a closure therein positioned on the front;

(c) said body having a fill chamber therein in communication with said fill cavity, also an air vent emerging from said body to atmosphere, the chamber receiving liquid scent from said fill cavity allowing sufficient quantity of liquid scent to be received within the dispenser;

(d) a dispensing reservoir having an open side disposed beneath said fill chamber in the body, further having a passageway to the fill chamber such that liquid scent deodorant flows freely therebetween;

(e) an air chamber integrally formed within the body under said reservoir having a plurality of apertures through the body front and an opening in the body back allowing air to pass from the opening through the apertures;

(f) a liquid absorbing wick media, lining the air chamber and the open side of said reservoir absorbing the liquid deodorant to a point of saturation and transferring the aroma of the liquid scent to the airstream through the process of vaporization; and,

(g) mounting means connected onto said body for fastening the dispenser to convenient appertainances in the airstream.

4,840,774

PROCESS FOR THE PRODUCTION OF ZIRCONIUM TETRACHLORIDE FROM DISSOCIATED ZIRCON

John S. Campbell, Gerrards Cross; Brian N. Baker, Pinner, and Anil Katyal, London, all of England, assignors to Tam Ceramics Inc., Niagara Falls, N.Y.

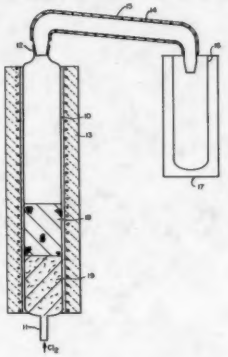
Continuation of Ser. No. 759,113, Jul. 25, 1985, abandoned. This application Jun. 26, 1987, Ser. No. 68,803

Claims priority, application United Kingdom, Aug. 1, 1984, 8419596

Int. Cl.[4] C01G *25/04*

U.S. Cl. 423—79 **11 Claims**

1. A process for the production of zirconium tetrachloride from dissociated zircon produced by melting zircon in a furnace to form a matrix of vitreous silica containing encapsulated zirconia, which process consists essentially of passing gaseous chlorine through pellets consisting of ground dissociated zircon, carbon and a binder at a temperature in the range of from 450° to 800° C. to produce a gaseous reaction mixture containing zirconium tetrachloride which contains less than about



0.22% by weight, calculated as SiO_2, of silicon tetrachloride, and recovering the zirconium tetrachloride therefrom.

4,840,775

METHOD FOR REMOVING SODIUM AND CHLORIDE FROM COBALTIC HYDROXIDE

Eric F. Husted, Ulster, and Judith A. Ladd, Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 13, 1987, Ser. No. 107,079

Int. Cl.[4] C01G *51/00;* **C22B** *23/00*

U.S. Cl. 423—150 **5 Claims**

1. A method for removing sodium and chloride from impure cobaltic hydroxide, said method comprising:

(a) firing said impure cobaltic hydroxide containing water, and the impurities of sodium and chloride at a temperature of from about 189° C. to about 850° C. to produce a dried cobaltic hydroxide;

(b) slurrying said dried cobaltic hydroxide in deionized water which contains an ionic compound wherein the concentration of said ionic compound is greater than about 0.05 molar to produce a purified cobaltic hydroxide; and

(c) removing said purified cobaltic hydroxide from the resulting liquor.

4,840,776

METHOD FOR REMOVING SODIUM AND AMMONIA FROM COBALT

Eric F. Husted, Ulster, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 13, 1987, Ser. No. 107,078

Int. Cl.[4] C01G *51/00;* **C22B** *23/00*

U.S. Cl. 423—150 **2 Claims**

1. A method for removing sodium and ammonia from cobalt, said method comprising:

(a) heating a solution of hexammine cobalt (III) chloride at a temperature of at least about 80° C.;

(b) adding sodium hydroxide to the resulting heated hexammine cobalt (III) chloride solution at a rate of addition not exceeding about 0.22 moles of sodium hydroxide per mole of cobalt per minute with the total amount of sodium hydroxide not exceeding about 1.4 times the stoichiometric amount required to form cobaltic hydroxide and allowing cobaltic hydroxide to precipitate;

(c) separating the resulting cobaltic hydroxide precipitate from the resulting mother liquor;

(d) washing said cobaltic hydroxide with hot deionized water to remove sodium so that the level of sodium in said

cobaltic hydroxide is equal to or less than about 60 weight parts per million on a cobalt basis; and

(e) firing the resulting washing cobaltic hydroxide at a temperature of from about 180° C. to about 850° C. to remove any water and ammonia which may be present therefrom.

4,840,777

PROCESS FOR INHIBITING MONO AND DIETHANOLAMINE DEGRADATION

Joseph A. Faucher, Carlsbad, Calif., assignor to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 144,654, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 921,458, Oct. 22, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 252,989

Int. Cl.[4] B01D *53/34*

U.S. Cl. 423—229 2 Claims

1. A process for the purification of a gas stream containing one or more of the following impurities: H_2S, COS, CO_2 and mercaptans, comprising; (i) contacting the gas stream with an aqueous solvent solution of stabilized monoethanolamine or diethanolamine in such a manner that the impurities are absorbed into the monoethanolamine solution or diethanolamine solution to form a rich solution; (ii) regenerating the monoethanolamine or diethanolamine solvent from the rich solution so as to remove the impurities and (iii) recycling the monoethanolamine or diethanolamine solvent into the aqueous solution and feeding it back into contact with the gas stream in a closed loop and (iv) introducing methyldiethanolamine into the recirculating aqueous solvent solution in an amount from about 4 to about 25 percent by weight based on the total weight of the solution so as to inhibit degradation of the monoethanolamine or diethanolamine in solution.

4,840,778

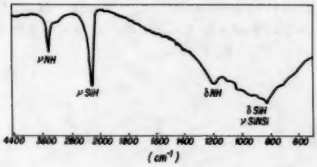
INORGANIC POLYSILAZANE AND METHOD OF PRODUCING THE SAME

Mikiro Arai, Iruma; Takeshi Isoda, Niiza, and Takuji Itoh, Sayama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1985, Ser. No. 801,884

Int. Cl.[4] C01B *33/00, 21/063, 33/06*

U.S. Cl. 423—324 24 Claims



1. Method for producing an inorganic polysilazane having at least a skeletal structure of the formula $(—SiH_2NH—)_n$ wherein n represents a numeral of at least 15 and a molecular weight of at least 690 comprising reacting a halosilane with a base other than ammonia to form a halosilane adduct and reacting the adduct with ammonia in an unreactive solvent, said base being selected from the group consisting of tertiary amines, sterically hindering-group containing secondary amines, phosphine, stibine, arsine, trimethylphosphine, dimethylphosphine, methyldiethylphosphine, triethylphosphine, trimethylarsine, trimethylstibene, trimethylamine, triethylamine, thiophene, furan, dioxane, selenophene and 1-methylphosphole.

4,840,779

CRYSTALLINE ZEOLITE LZ-202 AND PROCESS FOR PREPARING SAME

Thomas R. Cannan, Valley Cottage, N.Y., assignor to UOP, Des Plains, Ill.

Filed Jul. 8, 1985, Ser. No. 752,555

Int. Cl.[4] C01B *33/28;* C01G *23/047*

U.S. Cl. 423—328 50 Claims

1. A crystalline omega-type synthetic zeolite molecular sieve, denominated LZ-202,

(a) whose stoichiometric composition expressed in moles of oxide is

$$1.0\pm0.5M_{2/n}O:Al_2O_3:xSiO_2:yH_2O$$

wherein M represents at least one hydrogen, ammonium, alkali metal, alkaline earth, transition metal or rare earth lanthanide metal cation in oxidation state n, x has a value of from about 3 to about 20, and y has a value of from zero to about 20;

(b) having an X-ray diffraction pattern characteristic of an omega-type zeolite;

(c) whose fluorosilicate substitution product is more crystalline than that prepared from a calcined or oxidized omega-type zeolite synthesized using an organic template cation.

4,840,780

ZSM-51, METHOD OF PREPARING SAME AND CATALYTIC CONVERSION THEREWITH

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 479,522, Mar. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 438,817, Nov. 3, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,610

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—329 7 Claims

1. A method of making a synthetic zeolite having an x-ray powder diffraction pattern containing the interplanar spacing set forth in Table 1 of the specification which comprises reacting a mixture containing a source of silica, an organic template R, an alkali metal oxide, water, and alumina, said mixture having a composition, in terms of mole ratios, of oxides falling within the following ranges:

SiO_2/Al_2O_3: 15–25,000
OH^-/SiO_2: 0.005–1.0
M^+/SiO_2: 0.001–5.0
H_2O/SiO_2: 10–200
R/SiO_2: 0.01–3

wherein R is at least one organic cation selected from the group consisting of dimethylpiperidinium, trimethylene bis trimethylammonium and tetramethyl piperazinium and M is an alkali metal and maintaining said reaction mixture from about 80° C. to about 180° C. for about 2 to 10 days until said zeolite is formed.

4,840,781

PROCESS FOR PRODUCING A SILICON CARBIDE

Kaneo Noake, Minamata, Japan, assignor to Chisso Corporation, Japan

Filed Oct. 5, 1987, Ser. No. 104,156

Claims priority, application Japan, Oct. 7, 1986, 61-238829

Int. Cl.[4] C01B *31/36*

U.S. Cl. 423—345 4 Claims

1. A process for producing silicon carbide which comprises subjecting an organosilicon compound expressed by the formula:

$$R^1SiR^2_3$$

wherein R^1 represents a radical selected from the group consisting of saturated aliphatic hydrocarbon radicals, unsaturated aliphatic hydrocarbon radicals and aromatic hydrocarbon radicals, each having a carbon number of 3 to 10, and R^2

represents a chlorine atom or OR^3 group wherein R^3 represents an alkyl group of 1 to 4 carbon atoms to hydrolysis to obtain a liquid hydrolyzate of said organosilicon compound having a viscosity of 50 to 5×10^5 cP at 25° C., followed by calcining said hydrolyzate in an inert gas atmosphere.

4,840,782

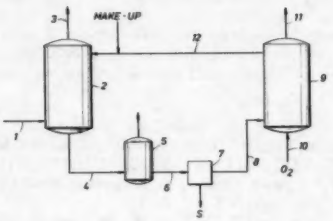
GAS TREATING PROCESS AND COMPOSITION

Dallas L. Byers, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 937,446, Dec. 5, 1986, abandoned, which is a continuation of Ser. No. 790,763, Oct. 23, 1985, abandoned, which is a continuation of Ser. No. 614,363, May 29, 1984, abandoned. This application Dec. 21, 1987, Ser. No. 139,140

Int. Cl.[4] C01B *17/05*

U.S. Cl. 423—576.6 **42 Claims**



1. A process for the removal of H_2S from a sour gaseous stream comprising

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution, at a temperature not greater than about 160° C., the reaction solution comprising an effective amount of vanadium V-containing ions to oxidize H_2S to elemental sulfur and being substantially free of anthraquinone disulfonate, and producing a sweet gas stream and an aqueous solution having a pH of 8–11 and containing sulfur and vanadium IV-containing ions, said reaction solution further comprising an amount of phosphate ions sufficient to provide a molar ratio of phosphate ions to vanadium IV-containing ions produced in solution of at least 0.1;

(b) removing sulfur from the aqueous solution, producing an aqueous solution having reduced sulfur content;

(c) regenerating aqueous solution having reduced sulfur content in a regenerating zone and producing regenerated reactant in said solution; and

(d) returning regenerated solution from step (c) to the contacting zone for use as aqueous reaction solution therein.

4,840,783

PROCESS FOR THE PRODUCTION OF HYDROGEN BY CATALYTIC REFORMING OF METHANOL WITH WATER VAPOR

Dang Vu Quang, Neuilly; Michel Davidson, Le Vesinet; Daniel Durand, Rueil-Malmaison, and Philippe Courty, Houilles, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

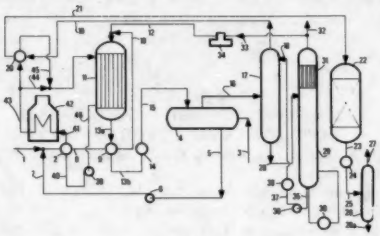
Filed Dec. 16, 1987, Ser. No. 133,843

Claims priority, application France, Dec. 16, 1986, 86 17712

Int. Cl.[4] C01B *1/05*

U.S. Cl. 423—648.1 **19 Claims**

1. A process for the production of hydrogen by catalytic reforming of methanol with steam, said process comprising admixing methanol, H_2O and carbon dioxide to form a feed mixture and delivering said feed mixture into contact with a catalyst containing copper, in a fixed bed, in a catalytic zone, at a temperature comprised between 150° to 400° C., wherein the molar ratio of the carbon dioxide to the methanol, at the input



of the catalytic zone, is comprised between 0.01–0.14 and the water/methanol ratio is 1.1–10 moles per mole.

4,840,784

USE OF PYRYLIUM AND THIAPYRYLIUM COMPOUNDS AS BIOLOGICAL STAINS

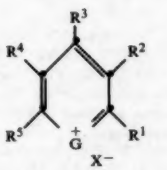
David S. Frank, Rochester, and Robert T. Belly, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 452,260, Dec. 22, 1982, Pat. No. 4,555,396. This application Aug. 9, 1985, Ser. No. 764,151

Int. Cl.[4] G01N *1/30*; C12Q *1/04*

U.S. Cl. 424—3 **9 Claims**

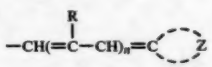
1. In a method for distinguishing cells in a biological sample by staining cells with a fluorescent dye, wherein the improvement comprises employing as the fluorescent dye a compound of the formula



wherein

G is O or S;

R^1, R^3, and R^5 are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, amino, styryl, bis(diaryl)vinylene, and



wherein

R is hydrogen or alkyl;

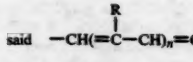
Z represents the carbon, nitrogen, oxygen, sulfur or selenium atoms necessary to complete a basic heterocyclic ring system used in cyanine dyes;

n is 0 or 1;

R^2 is hydrogen or, taken together with either R^1 or R^3, represents the elements needed to complete an aromatic or a carbocyclic ring system;

R^4 is hydrogen or, taken together with either R^3 or R^5 represent the elements needed to complete an aromatic or a carbocyclic ring system; and

X^- is an anion, provided that when both R^2 and R^4 are hydrogen, at least one of R^1, R^3 and R^5 is

said  group.

4,840,785

MAMMAL INTESTINAL HORMONE PRECURSOR AND ITS USE

Guro Gafvelin, Stockholm; Mats Carlquist, Sundbyberg, and Viktor Mutt, Solna, all of Sweden, assignors to Kabigen AB, Stockholm, Sweden

PCT No. PCT/SE86/00100, § 371 Date Nov. 10, 1986, § 102(e) Date Nov. 10, 1986, PCT Pub. No. WO86/05495, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 7, 1986, Ser. No. 934,449
Claims priority, application Sweden, Mar. 11, 1985, 8501203
Int. Cl.[4] A61K 49/00, 37/24; C07K 7/32
U.S. Cl. 424—9 15 Claims

1. A mammal intestinal hormone precursor having the following peptide structure: His-Ser-Asp-Gly-Thr-Phe-Thr-Ser-Glu-Leu-Ser-Arg-Leu-Arg-L-M-Ala-Arg-Leu-Gln-Arg-Leu-Leu-Gln-Gly-Leu-Val-Gly-N-O, wherein L is Glu or Asp, M is Gly or Ser, and N and O are selected from Lys and Arg.

4,840,786

AEROSOL ANTIPERSPIRANT COMPOSITIONS

Philip S. Johnson, and Theresa A. Bakken, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 22, 1988, Ser. No. 171,618
Int. Cl.[4] A01N 25/02
U.S. Cl. 424—43 9 Claims

1. An aerosol antiperspirant composition comprising:
(a) from about 2% to about 10% of a hydrophobic liquid selected from the group consisting of fatty acid and fatty alcohol esters, water-insoluble ethers and alcohols, polyorganosilicones, and mixtures thereof;
(b) from about 20% to about 95% of the propellant;
(c) from about 2% to about 30% of an enhanced efficacy metallic antiperspirant material, containing at least about 30% of a high efficacy metallic species (by weight of all metallic species in said antiperspirant material);
(d) from about 0.1% to about 3.0% of a hydrophobically-treated hectorite clay;
(e) from about 0.1% to about 3.0% of a hydrophobically-treated bentonite clay; and
(f) from about 0.01% to about 0.2% of an activator selected from the group consisting of propylene carbonate, ethanol, and mixtures thereof;
wherein the level of said activator is less than

$$0.03 + 0.165 \times \frac{(d)}{(d) + (e)} .$$

4,840,787

DENTIFRICE CONTAINING A POLY(HYDROXYPROPYL ETHER) NON-IONIC SURFACTANT AND A SPECIFIED CATIONIC POLYMER

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Jul. 14, 1987, Ser. No. 95,591
Claims priority, application Luxembourg, Sep. 15, 1986, 86586
Int. Cl.[4] A61K 7/16, 7/18, 7/22
U.S. Cl. 424—52 11 Claims

1. Dentifrice comprising:
(A) a poly(hydroxypropyl ether) nonionic surfactant, and
(B) a cationic polymer chosen from the group consisting of:
(i) a vinylpyrrolidone/di(C_{1-4})alkylamino(C_{2-18})-alkyl acrylate or methacrylate copolymer or a vinyl-pyrrolidone/di(C_1-C_4)alkylamino-2-hydroxypropyl acrylate or methacrylate copolymer, quaternized or non-quaternized, and
(ii) a cationic polysaccharide which is hydroxypropylated and quaternized quar gum resulting from the reaction of 2,3-epoxypropyltrimethylammonium chloride with guar gum;
wherein the poly(hydroxypropyl ether) surfactant is present in an amount of 0.1 to 4% by weight based on the total weight of the dentifrice; and
wherein the cationic polymer is present in an amount of 0.1 to 0.4% by weight based on the total weight of the dentifrice.

4,840,788

NONALCOHOLIC SUNSCREEN GEL

Vicki T. Beachell, Claymont, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jul. 15, 1986, Ser. No. 219,589
Int. Cl.[4] A61K 7/40, 7/42, 7/44
U.S. Cl. 424—59 6 Claims

1. An ethanol free clear oil-in-water transparent gel sunscreen composition comprising an oil phase comprising an oil and an emulsifier and a water phase having dissolved therein an emollient, said oil phase having dissolved therein an effective amount of ultraviolet radiation and absorbing ingredients comprising at least one p-amino-benzoic acid compound and at least one benzophenone compound.

4,840,789

ANTIPERSPIRANT CREAMS

Thomas V. Orr, and Gerard B. Meyer, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 16, 1987, Ser. No. 109,790
Int. Cl.[4] A61K 7/32, 7/34, 7/36, 7/38
U.S. Cl. 424—66 22 Claims

1. An antiperspirant cream composition comprising:
(a) from about 30% to about 50% of a volatile silicone oil;
(b) from about 10% to about 30% of a non-volatile liquid C_{12}–C_{25} saturated or unsaturated hydrocarbon emollient having a viscosity of at least about 2 cs at 25° C. selected from the group consisting of saturated and unsaturated dodecane, saturated and unsaturated tridecane, saturated and unsaturated tetradecane, saturated and unsaturated pentadecane, saturated and unsaturated hexadecane, saturated and unsaturated heptadecane, saturated and unsaturated octadecane, saturated and unsaturated nonadecane, saturated and unsaturated eicosane, saturated and unsaturated heneicosane, saturated and unsaturated docosane, saturated and unsaturated tricosane, saturated and unsaturated tetracosane, saturated and unsaturated pentacosane, isomers of these co pounds, and mixtures thereof;
(c) from about 2% to about 10% of a particulate thickening material; and
(d) from about 15% to about 45% of a particulate antiperspirant active material,
wherein said composition has a penetration force value of from about 150g to about 800g at 25° C. and at 50% relative humidity, and a total level of particulate material of from about 32% to about 40%.

4,840,790

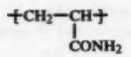
COSMETIC COMPOSITION FOR THE TREATMENT OF THE HAIR AND SCALP CONTAINING IN COMBINATION A POLY-BETA-ALANINE AND NICOTINIC ACID OR AN ESTER THEREOF

Jean-Francois Grollier, and Chantal Fourcadier, both of Paris, France, assignors to L'Oreal, Paris, France

Filed May 21, 1986, Ser. No. 865,441
Claims priority, application France, May 22, 1985, 85 07703
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] A61K *7/06*
U.S. Cl. 424—70 **12 Claims**

1. A cosmetic composition for the hair to retard the appearance of an oily aspect of the hair comprising in a cosmetically acceptable vehicle

(i) a water soluble polymer comprising 50 to 100% of units of the formula $-[CH_2-CH_2-CO-NH]-$ and from 0 to 50% of units of the formula



and

(ii) at least one nicotinic derivative selected from nicotinic acid or an ester thereof.

4,840,791

HAIR-WAVING PROCESS

Roger A. Mathews, Newbury Park; Edward R. Moore, Canoga Park, and David W. Cannell, Los Angeles, all of Calif., assignors to Redken Laboratories, Inc., Canoga Park, Calif.

Continuation of Ser. No. 577,169, Feb. 6, 1984, abandoned. This application Aug. 20, 1985, Ser. No. 767,500
Int. Cl.[4] A61K *7/09*
U.S. Cl. 424—71 **2 Claims**

1. In a process for the permanent waving of hair in which, washed hair wound on a mandrel is subjected to the action of a reactive waving solution applied to the mandrel-wound hair, the waving solution having a pH of from 6.8 to 7.0 containing, for cleavage of the cystine bonds, glycerol monothioglycolate and the step of applying peroxide oxidizing agent to the mandrel-wound hair, after rinsing of the hair, to reform the cystine bonds, the improvement which comprises:

(a) blotting the hair after cleavage of the cystine bonds to remove reactive waving solution from the hair leaving a remainder to maintain the level of cleaved cystine bonds;

(b) applying to the blotted mandrel-wound hair a protein-flow solution and allowing the protein-flow solution to remain in contact with the hair for a period of time of from about 5 to about 10 minutes to induce protein flow in the hair to achieve a desired curl configuration, said protein-flow solution being an aqueous protein-flow solution having a pH from about 2 to about 10 and said protein-flow solution being an aqueous solution of magnesium sulfate present in concentration of about 1 to 10 percent by weight of solution of, and a water-soluble hydroxyorganic compound containing up to about 4 carbon atoms and at least one hydroxyl group present in a concentration of from 2 percent by weight up to 5 percent by weight of solution, and 0.5 to 6 percent by weight nonionic surfactant and thereafter;

(c) rinsing the protein-flow solution from the mandrel-wound hair; and

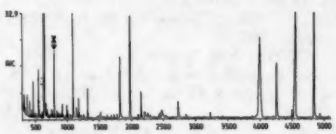
(d) applying the oxidizing agent to the mandrel-wound hair to reestablish the cystine bonds to fix the curl.

4,840,792

AGENT NEUTRALIZING BAD SMELLS FROM EXCRETIONS AND EXCREMENTS OF ANIMALS

Daniel Joulain, Grasse; Philippe Racine, Chateauneuf de Grasse, and Francoise Maire, Neuilly sur Seine, all of France, assignors to Robertet S.A., Grasse, France

PCT No. PCT/FR87/00185, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/07152, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 159,595
Claims priority, application France, May 29, 1986, 86 07856
Int. Cl.[4] A61L *9/01*
U.S. Cl. 424—76.1 **5 Claims**



1. A method for neutralizing disagreeable odours from animal excretions and excrement, comprising the steps of applying to a surface having a significant odour from animal excretions or excrement an agent including a compound selected from the group consisting of C_{10} to C_{12} aliphatic alcohols, C_{10} to C_{13} aldehydes, C_{13} to C_{18} aliphatic ketones, aromatic ketones having a musk odour and up to 18 carbon atoms, C_8 to C_{15} aliphatic esters, methyl anthranilate, methyl N-methylanthranilate, p-cresyl phenylacetate, amyl salicylate, coumarin, dihydrocoumarin, gammadecalactone, dodecalactone, undecalactone, eugenol, isoeugenol, diphenyl oxide, the methyl and ethyl ethers of naphthol, galaxolide, indole and its reaction products with hydroxycitronella, tridecene-2-nitrile, and 2-(2'-methyl-pent-2'-enyl)-5-methyl pyridine, in an amount effective to neutralize disagreeable odors from said excretions or excrement, said agent having a vapour tension of less than or equal to 4 Pa at 25° C.

4,840,793

METHOD OF REDUCING TISSUE DAMAGE AT AN INFLAMMATORY SITE USING A MONOCLONAL ANTIBODY

Robert F. Todd, III; Benedict R. Lucchesi; Paul J. Simpson, all of Ann Arbor, Mich.; James D. Griffin, Sherborn, and Stuart F. Schlossman, Newton Centre, both of Mass., assignors to Dana-Farber Cancer Institute, Boston, Mass. and The University of Michigan, Ann Arbor, Mich.

Filed Jun. 11, 1987, Ser. No. 61,336
Int. Cl.[4] A61K *39/395*
U.S. Cl. 424—85.8 **11 Claims**

1. A method of treating a human or animal host with the intent of reducing tissue damage occurring at an inflammatory site in any part of the body of the host experiencing a phagocyte-mediated inflammatory condition, said method comprising:

administering in vivo a monoclonal antibody having the binding specificity of the MY904 murine monoclonal antibody produced by the cell line A.T.C.C. No. HB 9510 which will bind specifically to an epitope expressed on the CD11b part of the CD11/CD18 glycoprotein of the Mol antigen expressed on the surface of granulocytes and other phagocytic cells and will inhibit the CD11/CD18 adhesion dependent cellular interactions of such cells reflecting their immunological inflammatory response function which contributes to such damage and yet, not interfere with the binding of iC3b.

4,840,794

MASTITIS VACCINE CONTAINING ANTIGENS FROM *S. AUREUS*

Dennis L. Watson, Armidale, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU86/00134, § 371 Date Jan. 12, 1987, § 102(e) Date Jan. 12, 1987, PCT Pub. No. WO86/06634, PCT Pub. Date Nov. 20, 1986
PCT Filed May 13, 1986, Ser. No. 12,060
Claims priority, application Australia, May 13, 1985, 528/85
Int. Cl.[4] A61K *37/085*
U.S. Cl. 424—92 14 Claims

1. A killed vaccine effective in the immunization of ruminants against intramammary challenge by *S. aureus* and other species of the genes Staphylococcus, which comprises the antiphagocytic in vivo antigen(s) produced by the in vitro culture of a pseudocapsule—producing strain of *S. aureus* in a nutrient growth medium which is enhanced by the addition of milk or a milk component thereto.

4,840,795

PREPARATION AND METHOD FOR EFFECTING FAT AND LIPID ADSORPTION

Shmuel Ben-Sasson, Jerusalem, Israel, assignor to Rafa Laboratories, Israel

Division of Ser. No. 787,315, Oct. 15, 1985, Pat. No. 4,780,307.
This application Nov. 20, 1987, Ser. No. 123,300
Claims priority, application Israel, Oct. 23, 1984, 73921
Int. Cl.[4] A61K *33/08*
U.S. Cl. 424—690 15 Claims

1. Pharmaceutical preparation for fat and lipid adsorption upon administration thereof, said preparation being in a form for oral administration and providing a fat and lipid adsorption effective amount of aluminium hydroxide having a specific surface area of at least 400 m^2 per g and having a high degree of adsorption of dietary lipids and fats while having negligible antacid activity,

said aluminium hydroxide being capable of adsorbing at least 1 g of fat per g of said aluminium hydroxide, and

said preparation being in the form of an aqueous suspension, whereby ingestion of said preparation causes excretion of dietary lipids.

9. Method of effecting fat and lipid adsorption, which comprises administering a fat and lipid adsorption effective amount of aluminium hydroxide having a specific surface area of at least 400 m^2 per g and having a high degree of adsorption of dietary lipids and fats while having negligible antacid activity, said aluminium hydroxide being capable of adsorbing at least one g of fat per g of aluminium hydroxide.

whereby said administration causes excretion of dietary lipids.

4,840,796

BLOCK COPOLYMER MATRIX FOR TRANSDERMAL DRUG RELEASE

Randall P. Sweet; Chi-long Lee, and Gerald A. Gornowicz, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 22, 1988, Ser. No. 184,748
Int. Cl.[4] A61F *13/02*
U.S. Cl. 424—448 15 Claims

1. In a transdermal drug delivery system, comprising in combination:

(a) an impermeable backing member;

(b) a matrix containing a medicinally active ingredient; and,

(c) means to attach said system to the skin of a patient;

the improvement which comprises:

said matrix comprising a substantially linear thermoplastic block copolymer which is a reaction product of a polydiorganosiloxane which forms soft segments in said reaction product and a diisocyanate which forms hard segments, said copolymer having a glass transition temperature between about 45° C. and 160° C. said soft segments forming from about 80 to 99 percent by weight, based on the weight of said copolymer, said hard segments forming about 1 to 20 weight per cent, based on the weight of said copolymer, the average molecular weight of said copolymer being between about 15,000 and 500,000.

4,840,797

CONFECTIONERY OR PHARMACEUTICAL PRODUCT WITH A SUGARLESS COATING OBTAINED BY HARD COATING AND METHOD FOR ITS PREPARATION

Bernard Boursier, Violaines, France, assignor to Roquette Freres, Lestrem, France

Filed Apr. 21, 1986, Ser. No. 854,135
Claims priority, application France, Apr. 30, 1985, 85 06579
Int. Cl.[4] A23G *3/30, 7/00;* A01N *25/00*
U.S. Cl. 424—475 8 Claims

1. Confectionery or pharmaceutical product provided with a hard sugarless coating obtained by hard coating using a maltitol syrup having a dry matter content from 50 to 70% by weight, the said coating being essentially crystalline and comprising at least 90% by weight of maltitol.

4,840,798

ASTRINGENT GEL COMPOSITION AND METHOD FOR USE

Dennis A. Skaliotis, New Bedford, Mass., assignor to Theon, Inc., New Bedford, Mass.

Filed Jul. 27, 1988, Ser. No. 224,809
Int. Cl.[4] A61K *9/14, 9/16, 31/28*
U.S. Cl. 424—488 14 Claims

1. An astringent gel composition for treating inflammatory skin conditions, erythema, chapping and skin irritations comprising a uniform mixture of:

(a) an aqueous solution of aluminum acetate containing from about 2.0 to about 7.0% by weight of aluminum, acetate,

(b) a gelling agent present at a level of from about 0.5 to about 4.0% by weight,

(c) a lower polyalkylene glycol present at a level of from about 0.5 to about 2.0% by weight,

(d) a C_2 to C_4 alkylene glycol present at a level of from about 5 to about 25% by weight, and

(e) a saturated aqueous solution of calcium sulfate,

said aluminum acetate being present in therapeutically effective amounts and said calcium sulfate being present in an amount sufficient to enhance the storage stability of the composition.

4,840,799

PROCESS FOR PREPARING RAPIDLY DISINTEGRATING GRANULATES

Curt H. Appelgren, Kungsbacka; Eva C. Eskilsson, Mölnlycke, and Jonas P. Uvdal, Gothenburg, all of Sweden, assignors to Lejus Medical Aktiebolag, Molndal, Sweden

Filed Feb. 17, 1987, Ser. No. 15,011
Claims priority, application Sweden, Feb. 14, 1986, 8600657
Int. Cl.[4] A61K *9/50*
U.S. Cl. 424—493 20 Claims

1. A process for the preparation of a rapidly disintegrating core comprising a pharmaceutically active compound, said process comprising adding an emulsifier/tenside having a HLB-value corresponding to the solubility characteristics of the pharmaceutically active compound in a solution or a suspension of the pharmaceutically active compound in a water-:alcohol mixture having a weight ratio of 40–80:60–20 to form a pumpable composition, subjecting the pumpable composition to an intense treatment in an apparatus selected from the group of homogenizer, colloid mill, pearl mill, and pebble mill wherein the composition is distributed over a bed of at least one solid material having a large effective surface area and having nonbinding properties to the said pharmaceutically active compound so as to form an agglomerate, and drying the

agglomerate to form a granulate having irregular or spherical form.

4,840,800

SOYBEAN FIBER IN INSECT REARING MEDIA

Robert L. Harris, 2704 Broadmoor, Bryan, Tex. 77802

Filed Nov. 16, 1987, Ser. No. 121,161
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 4 Claims

4. In an improved method of making an insect larval media manufactured by blending nutritionally balanced amounts of dry ingredients selected from group consisting of carbonaceous and/or proteinaceous ingredients, vitamin supplements, preservatives and mixtures thereof, and tableting the ingredients before adding cold water: the improvement comprising:

adding to the ingredients, prior to tableting about 65% soybean fiber by weight of the dry mixture;

whereby the media is solidified when cold water is added.

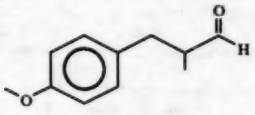
4,840,801

USE OF SCHIFF BASE REACTION PRODUCT OF METHYL ANTHRANILATE AND CANTHOXAL IN AUGMENTING OR ENHANCING AROMA OR TASTE OF FOODSTUFF OR CHEWING GUM

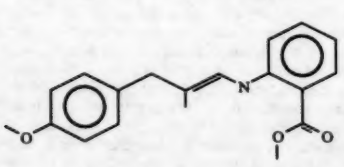
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y.; Keith P. Sands, Marlboro, N.J., and Myrna L. Hagedorn, Edison, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 114,247, Oct. 19, 1987, Pat. No. 4,775,720.
This application Jun. 3, 1988, Ser. No. 202,046
Int. Cl.[4] A23L *1/235*
U.S. Cl. 426—3 1 Claim

1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of intimately admixing with said foodstuff or chewing gum from 0.02 parts per million up to about 50 parts per million by weight based on said foodstuff or chewing gum of a Schiff base reaction product produced according to the process of reacting methyl anthranilate with canthoxal having the structure:



whereby a composition of matter containing the compound having the structure:



is produced.

4,840,802

PROCESS FOR BREWING BEER WHILE ENHANCING YEAST GROWTH

Chris E. Lindberg, Milwaukee; Edward J. Kot, Delafield, and Etzer Chicoye, Milwaukee, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Nov. 6, 1985, Ser. No. 795,629
Int. Cl.[4] C12C *11/04, 3/00;* C12N *1/38, 1/18*
U.S. Cl. 426—16 2 Claims

1. In the method of brewing which includes fermenting a wort and adding an effective amount of zinc ions to the wort to enhance yeast growth, the improvement which comprises adding the zinc ions to the wort as ashed trub which has been prepared by heating trub to destroy the organic combustibles.

4,840,803

PROCESS AND DOUGH COMPOSITION FOR PRODUCING MULTI-TEXTURED COOKIES CONTAINING HARD FATS

Robert A. Polizzano, Teaneck, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 10, 1985, Ser. No. 786,088
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—94 23 Claims

1. A process for preparing a multi-textured cookie which process comprises:

mixing flour, a humectant and fat or shortening to produce a first cookie dough;

mixing flour, a sugar and fat or shortening, to produce a second cookie dough, at least about 12 percent by weight of the fat or shortening in the second cookie dough being a hard vegetable fat having a solid fat index of at least about 40 percent at 70° F., the remaining fat or shortening used in the second cookie dough having a solid fat index in the range of from about 15 to about 25 percent at 70° F.;

enrobing a portion of the first cookie dough within a portion of the second cookie dough to produce a composite dough piece; and

baking the composite dough piece to form a multi-textured cookie with a center having a soft and moist texture and a firm outer layer.

4,840,804

METHOD OF DEHYDRATING FOODS IN MELTED ERYTHRITOL

Tsutomu Kondou, Sagamihara, Japan, assignor to Mitsubishi Chemical Industries Limited and Nikken Chemicals Company, Limited, both of, Japan

Filed Apr. 12, 1988, Ser. No. 180,479
Claims priority, application Japan, Apr. 14, 1987, 62-91600
Int. Cl.[4] A23B *7/02;* A23L *1/09*
U.S. Cl. 426—103 7 Claims

1. A dehydrated food having a surface which has been at least partially immersed in erythritol at elevated temperature.

4,840,805

PROCESS FOR PREPARING STERILIZED PACKAGED FISH AND PRODUCT THEREOF

Ko Sugisawa; Yasushi Matsumura, both of Nara; Hidefumi Okamoto, Osaka, and Kumiko Abe, Nara, all of Japan, assignors to House Food Industrial Co., Ltd., Higashiosaka, Japan

Filed Apr. 7, 1987, Ser. No. 35,190
Claims priority, application Japan, Apr. 16, 1986, 61-87697
Int. Cl.[4] A23L *1/325, 3/00*
U.S. Cl. 426—129 12 Claims

1. A packaged fish product prepared by a process comprising:

drying a fish selected from the group consisting of sardine, horse mackerel, pacific saury, mackerel, salmon, yellowtail, spanish mackerel, herring, eel, conger eel, flatfish, sea bream and pollack to a water content of 35 to 82 wt.%;

broiling the dried fish until it has a hardness ranging from 105 to 1250 g;

hermetically packaging said broiled fish; and heat sterilizing the packaged fish.

4,840,806

STORAGE STABLE TOMATO - BASED SAUCE

Roy Hyldon, Bloomington, and Usha Bhatia, St. Paul, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 36,632, Apr. 10, 1987, abandoned. This application May 27, 1988, Ser. No. 201,302

Int. Cl.[4] A23L *1/272, 1/39*

U.S. Cl. 426—270 15 Claims

1. A method of preventing loss of color and flavor of a tomato-based sauce said method comprising:

(a) forming a sauce having tomato solids, on a dry basis, in an amount in excess of about 6% by weight of sauce, total water in an amount in excess of about 30% by weight of sauce and edible acid in an amount sufficient to provide a sauce pH of about 4.2 or lower.

(b) after forming said sauce, storing said sauce under frozen storage conditions.

4,840,807

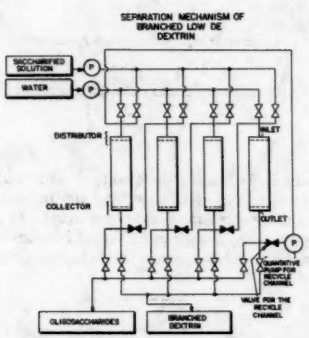
BRANCHED DEXTRIN PRODUCTION AND COMPOSITIONS CONTAINING SAME

Tsukasa Yoshida; Yoshio Ishige, both of Yotsukaido; Masaki Matsudaira, and Tadashi Takahashi, both of Chiba, all of Japan, assignors to Sanmatsu Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,281

Int. Cl.[4] A23L *1/00*

U.S. Cl. 426—48 6 Claims



1. A process for producing branched dextrin which process comprises the steps of:

(a) reacting alpha-amylase with starch to produce a saccharified solution composed mainly of branched dextrin containing alpha-1,6-linkages and linear oligosaccharides containing alpha-1,4-linkages, and

(b) contacting the thus obtained saccharified solution with a gel-type filtering agent thereby selectively fractionating and separating said branched dextrin substantially free of said linear oligosaccharices, said branched dextrin having a mean molecular weight of from about 800 to about 16,000.

4,840,808

METHOD OF PRESERVING COLOR OF VEGETABLE PASTA PRODUCTS

Yanien Lee, Manlius; Carleton G. Merritt, Phoenix, and Nancy E. Dermody, Camillus, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Filed Sep. 23, 1987, Ser. No. 99,923

Int. Cl.[4] A23L *1/16*

U.S. Cl. 426—270 21 Claims

1. A method of preserving the color and texture of fresh green vegetable pasta comprising:

(a) subjecting fresh green vegetable matter to an aqueous alkaline solution for a period of time and at a temperature sufficient to hydrolyze or partially hydrolyze the methyl and phytyl ester groups of the chlorophyll contained in the green vegetable matter, whereby the methyl and phytyl ester groups of the chlorophyll are converted to the respective alkali salts, wherein the pH of the alkaline solution is maintained between 9.0 and 11.0 by addition of sufficient buffer and wherein the buffer comprises a cation selected from the group consisting of calcuim, sodium, potassium, magnesium, zinc, copper and aluminum;

(b) preparing a puree of the hydrolyzed vegetable matter of step (a) wherein the pH is maintained between 9.0 and 11.0;

(c) blending a mixture comprised of glutinous flour, the puree of hydrolyzed vegetable matter of step (b), and water, to form a green alimentary vegetable paste, wherein the pH of said alimentary vegetable paste is above 7.0 and below 9.0;

(d) extruding by internal pressure said green alimentary vegetable paste through holes in an extruder die having a plurality of holes, or by sheeting said green alimentary vegetable paste by pressing it between rollers; and

(e) drying extruded or sheeted green alimentary vegetable paste to produce vegetable paste which retains the green color of the vegetable matter.

4,840,809

AGGLOMERATION PROCESS

Sheng H. Hsu, Marysville, Ohio, assignor to Nestec S.A., Vevey, Switzerland

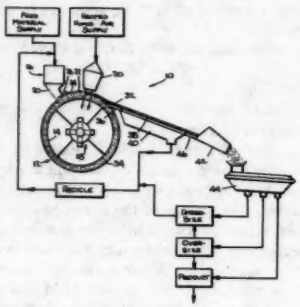
Filed Apr. 11, 1988, Ser. No. 180,226

Int. Cl.[4] A23F *5/12*

U.S. Cl. 426—285 12 Claims

1. A process for agglomerating particles of water-soluble particulate materials comprising conveying a layer of particles of water-soluble particulate material on a porous surface, directing a laminar flow of heated humid air towards the layer of particles being conveyed and applying a reduced pressure from beneath the porous surface for drawing the heated humid air to the layer of the material for contacting the heated humid air with particles of the conveyed particulate material layer for a

time sufficient for fusing particles of the layer at points of contact between the surfaces of the particles while substantially avoiding condensation of moisture in voids between the surfaces of the particles.

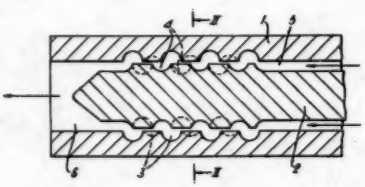


4,840,810

PROCESS FOR THE PREPARATION OF AN EDIBLE FAT-CONTAINING PRODUCT

Janos Bodor, Rijswijk; Jan van Heteren, Vlaardingen; Henricus W. Willemse, Schiedam, and Leo F. Vermaas, Lijsterlaan, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 24, 1986, Ser. No. 843,338
Claims priority, application United Kingdom, Mar. 27, 1985, 8508012; Netherlands, May 24, 1985, 8501486
Int. Cl.[4] A23D 3/00
U.S. Cl. 426—312 25 Claims



1. Process for the preparation of an edible plastified fat-containing product comprising heatexchanging a composition comprising at least 10 wt. % fat wherein the balance of the composition comprises material selected from the group consisting of water, gas, protein, additional fat, and mixtures thereof by passing the composition through a heat-exchanger comprising two closely spaced mutually displaceable surfaces, each having a pattern of cavities which overlap during movement of one surface with respect to the other, between which surfaces the composition passes, at least one of which surfaces is provided with means to control the temperature thereof, thereby substantially, simultaneously and homogeneously shearing and heating or shearing and cooling said composition to control the change in crystal structure thereof to produce said product.

4,840,811

PROCESS FOR PRODUCING COLORLESS, ODORLESS AND TASTELESS CASSIA ENDOSPERM FLOUR

Friedrich Bayerlein, Krailling; Nikolaos Keramaris, Eichenau; Nikolaus Kottmair, Gauting; Manfred Kuhn, Munich, all of Fed. Rep. of Germany, and Michel M. Maton, Vaucresson, France, assignors to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,820
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634645
Int. Cl.[4] A23L 1/04
U.S. Cl. 426—430 20 Claims

1. A process for producing a cassia endosperm flour which is practically colorless, odorless and tasteless and which has a high synergistic gelling property when combined with carrageenan, xanthan, polyacrylates or mixtures thereof, which comprises

(a) extracting the endosperm flour of cassia tora having characteristic color, odor and taste with an extraction liquid comprising a mixture of about 5% by weight to about 90% by weight water and an agent selected from the group consisting of alkanol, acetone and mixtures thereof, the extraction proceeding at a temperature of about 25° C. for a sufficient time to provide a flour lacking said characteristic color, odor and taste, and

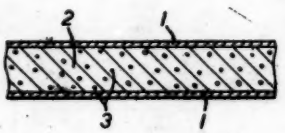
(b) drying the resulting cassia endosperm flour.

4,840,812

METHOD OF ADJUSTING THE QUALTITY OF LIQUORS

Yasunori Tominaga, Tokyo, Japan, assignor to Live International Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,512
Claims priority, application Japan, Oct. 29, 1986, 61-257897
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] C12G 3/08
U.S. Cl. 426—488 14 Claims



1. A method of adjusting the quality of an alcoholic liquor which comprises the step of absorbing and removing part of the odor-emitting substances and water contained therein by means of osmosis by bringing the liquor into contact with a highly osmotic substance contained between semipermeable membranes.

4,840,813

LOW AND NON-FAT FROZEN DAIRY DESSERTS AND METHOD OF PREPARATION

Norman A. Greenberg, New Hope; Ramesh C. Chandan, New Brighton; William D. Deeslie, Maple Grove, all of Minn., and Daniel D. Conolly, Berkeley, Calif., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 24, 1987, Ser. No. 88,744
Int. Cl.[4] A23G 9/02, 9/04
U.S. Cl. 426—565 31 Claims

1. A method for preparing a liquid mix useful for making an aerated milk based frozen desert of reduced fat content having the organoleptic properties of high fat ice creams, comprising the steps, in sequence of:

A. providing a sweetened milk blend mixture comprising,

(1) about 0.1% to about 9% butterfat by weight of the mixture,
(2) about 4% to about 7% by weight of the blend of casein,
(3) about 1.5% to about 4% by weight of the mixture of whey protein,
(4) about 13% to about 17% by weight of the mixture of sucrose,
(5) about 0.5% to about 2% dry weight of the mixture is ash, wherein the lactose concentration of the mixture is less than 10%, wherein the whey protein to casein ratio ranges from about 1:0.5 to 3, wherein at least a portion of the whey protein is undenatured;

B. heating the mixture at temperatures and times sufficient to provide the mixture with a whey protein denaturation ranging from about 50% to 100%;

C. cooling the mixture to a temperature ranging from 40° F. to 70° F. to form a cooled liquid dessert composition.

4,840,814

PROCESS FOR MAKING A CALCIUM ENRICHED MILK

Hidetoshi Harada, Sanitama; Satoshi Chihara, Tokyo; Yutaka Suginaka, Saitama; Shigeko Suido, Tachikawa, and Toshitaka Kobayashi, Saitama, all of Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation of Ser. No. 746,784, Jun. 20, 1985, abandoned. This application Jun. 20, 1987, Ser. No. 78,016
Claims priority, application Japan, Jul. 3, 1984, 59-136495
Int. Cl.[4] A23C *3/00*
U.S. Cl. 426—580 **6 Claims**

1. A process for producing a calcium enriched milk or toned milk which does not coagulate upon boiling, comprising the steps of upwardly adjusting the pH of said milk or toned milk to above 6.7, adding calcium to said milk or toned milk in the form of a water-soluble calcium salt of an organic acid, and then lowering the pH of said milk or toned milk, wherein:

all upward adjustment of said pH is accomplished exclusively by adding an alkali metal hydroxide, carbonate or bicarbonate to said milk or toned milk;

all lowering of said pH of said milk or toned milk is accomplished exclusively by said addition of said calcium salt after said upward adjustment;

said calcium salt is added in an amount of 30–90 mg% and lowers said pH of said milk or toned milk to a value above that of said milk or toned milk prior to said upward adjustment and within a range of 6.6–7.9; and

said milk or toned milk is sterilized and cooled prior to the upwardly adjustment of the pH; and

wherein the amount of said alkali metal hydroxide carbonate or bicarbonate is such that the calcium enriched milk or toned milk does not coagulate upon a one minute boiling.

4,840,815

LOW CALORIC ALKYL GLYCOSIDE FATTY ACID POLYESTER FAT SUBSTITUTES

Richard S. Meyer; Jeffrey M. Root, both of Tacoma; Michael L. Campbell, Kent, and Daryl B. Winter, Seattle, all of Wash., assignors to Curtice-Burns, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 49,625, May 13, 1987, abandoned. This application Nov. 18, 1987, Ser. No. 122,188
Int. Cl.[4] A23D *5/00*
U.S. Cl. 426—611 **7 Claims**

1. A low calorie food composition comprising:

nonfat ingredients, and

fat ingredients, wherein from about 5.0% to about 95% of the fat ingredients comprises an alkyl glycoside fatty acid polyester having at least four fatty acid ester groups,

wherein the fatty acid ester groups comprise both saturated and unsaturated fatty acid ester groups, each fatty acid having from 4 to 24 carbon atoms, and

wherein the alkyl glycoside moiety comprises a saccharide portion and an alkyl portion, the alkyl portion having from 1 to 24 carbon atoms.

4,840,816

METHOD OF FABRICATING OPTICAL WAVEGUIDES BY ION IMPLANTATION DOPING

Bill R. Appleton, Oak Ridge, Tenn.; Paul R. Ashley, Toney, Ala., and Christopher J. Buchal, Juelich, Fed. Rep. of Germany, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 24, 1987, Ser. No. 29,570
Int. Cl.[4] B05D *3/06*; C23C *14/00*
U.S. Cl. 427—38 **8 Claims**

1. A method for fabricating an optical waveguide in an oxide crystalline substrate, comprising the steps of:

providing said crystalline substrate in the form of an optical quality crystalline oxide body;

implanting a dopant into said crystalline oxide body over a selected waveguiding region by directing a beam of ions of a selected heavy metal dopant onto a patterned region defining said selected region of said crystalline oxide body at a selectec concentration and energy for a period sufficient to alter the refractive index of said crystalline oxide body to provide optical waveguiding through said patterned region while maintaining said oxide body at a low temperature sufficient to substantially prevent thermal diffusion of said copant and disloged crystal atoms within said crystalline oxide body; and

annealing said crystalline oxide body in a water saturated oxygen atmosphere at a selected temperature and period of time sufficient to induce epitaxial regrowth of the ion implanted region of said crystalline structure of said crystalline oxide body to restore crystal structure and incorporate said copant into the crystalline lattice of said oxide body.

4,840,817

METHOD FOR TREATMENT OF FIBROUS MATERIALS

Shuichi Murakami, and Yasunao Shimano, both of Ishikawa, Japan, assignors to Komatsu Seiren Co., Ltd., Ishikawa, Japan

Filed Feb. 23, 1988, Ser. No. 159,094
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—45.1 **9 Claims**

1. A method for the treatment of fibrous materials, which comprises (A) impregnating a fibrous material with a treating agent comprising (1) a tetrakishydroxymethyl phosphonium compound or an ammonium condensate of tetrakishydroxymethyl phosphonium compound, in a concentration in the range of 20 to 80%, (2) methylolmelamine in a concentration of 2 to 30% and (3) urea, thiourea or a guanidine salt, in a concentration of 2 to 30%, (B) heating the fibrous material with high-pressure steam under a pressure in the range of 0.1 to 3 kg/cm^2 or subjecting the fibrous material to a microwave heat treatment in the presence of water vapor, and (C) drying the fibrous material.

4,840,818

METHOD OF MAKING MAGNETIC RECORDING MEDIUM

Hiroshi Chikamasa; Masaaki Utsui, and Yasutami Nojiri, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

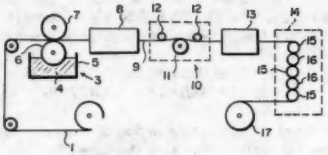
Filed Apr. 6, 1987, Ser. No. 34,975
Claims priority, application Japan, Apr. 4, 1986, 61-77596
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—130 **6 Claims**

1. A method of making a magnetic recording medium by forming a recording layer composed of a ferromagnetic material on a strip-like substrate, the method of making a magnetic recording medium comprising:

(i) a first step of applying said ferromagnetic material onto the surface of said substrate,

(ii) a second step of drying said ferromagnetic material applied on the surface of said substrate,

(iii) a third step of grinding the surface of the dried recording layer on said substrate, to remove portions of said record-



ing layer protruding from said surface and create loose process grains on said surface,

(iv) a fourth step of removing the loose process grains clinging to the ground surface of said recording layer, and

(v) a fifth step of calendering the surface of said recording layer from which the loose process grains have been removed.

4,840,819

METHOD FOR PREPARING COMPOSITE MEMBRANES FOR ENHANCED GAS SEPARATION

Samuel C. Williams, Canton; Benjamin Bikson, Brookline; Joyce K. Nelson, Lexington, and Robert D. Burchesky, Norwood, all of Mass., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 8, 1987, Ser. No. 35,781

Int. Cl.[4] B05D *5/00, 3/00*

U.S. Cl. 427—245 **18 Claims**

1. In the process of preparing a composite membrane capable of selectively permeating a more readily permeable component of a gas mixture in gas separation operations and having a separation layer that determines the separation characteristics of the membrane and a porous support layer, the improvement comprising:

(a) coating the porous support layer with a wet separation layer of membrane material, said support layer containing a controlled amount of liquid in the range of from about 10% to about 90% by weight of the liquid present in said support layer in fully wet form, said liquid being a solvent or non-solvent for the material of the separation layer; and

(b) drying said separation layer on the porous support layer, the presence of said liquid in the porous support layer precluding any appreciable penetration of the membrane material into the pores of said porous support layer, the separation layer thereby being of a non-occlusive nature with enhanced permeation characteristics, and having thickness of about 0.4 microns or less,

whereby the composite membrane exhibits essentially the separation characteristics of the very thin, non-occlusive membrane layer while achieving enhanced permeation and an advantageous combination of selectivity and permeability for the desired gas separation operations.

4,840,820

ELECTROLESS NICKEL PLATING OF ALUMINUM

Paul B. Schultz, Farmington, and Eugene F. Yarkosky, Milford, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Continuation of Ser. No. 663,826, Oct. 23, 1984, Pat. No. 4,567,066, which is a continuation of Ser. No. 525,358, Aug. 23, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 786,988

Int. Cl.[4] C23C *3/02*

U.S. Cl. 427—305 **5 Claims**

1. In a process for plating zinc or tin coated aluminum substrates with an adherent, non-blistered electroless metal coating by metal plating from a first electroless plating bath to the desired thickness, the bath being replenished as needed to maintain the desired metal concentration, and with the bath being used until the electroless metal coatings produced on the substrates are non-adherent and blistered after which the bath is discarded, the improvement whereby the lift of the bath is increased comprising:

plating a thin coating of the metal on the substrates from a second electroless metal plating bath prior to plating to the desired thickness with the first bath, both electroless metal plating baths containing a source of metal ions and a reducing agent to reduce the metal ions.

4,840,821

METHOD OF AND APPARATUS FOR FORMING FILM

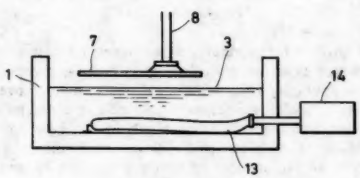
Toshihiko Miyazaki; Kunihiro Sakai, both of Tokyo; Yoshinori Tomida, Yokohama; Hiroyuki Sugata, Kawasaki; Hiroshi Matsuda, Yokohama, and Yukuo Nishimura, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 864,536, May 19, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 157,146

Claims priority, application Japan, May 27, 1985, 60-112066; May 27, 1985, 60-112067; May 27, 1985, 60-112069

Int. Cl.[4] B25D *1/20*

U.S. Cl. 427—430.1 **2 Claims**



1. A method of forming a Langmuir-Blodgett film on a substrate which comprises:

positioning a surface of said substrate such that it faces the surface of a first liquid on which a group of molecules is spread, said liquid contained in a reservoir; and

supplying and discharging a second liquid to said reservoir which can be distinctly separated from said first liquid so as to increase and decrease the total volume of liquid in the reservoir thereby moving up and down the surface of said first liquid over which said group of molecules is spread, wherein said liquids are in contact and immiscible with one another with each having a different viscosity and specific gravity from the other such that said liquids do not mix and such that said second liquid which is supplied to and discharged from said reservoir remains in the lower portion of said reservoir.

4,840,822

DECORATIVE NETTING BOW AND METHOD OF MAKING SAME

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Jun. 2, 1988, Ser. No. 201,781

Int. Cl.[4] D04D *7/10*

U.S. Cl. 428—4 **23 Claims**

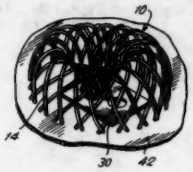
1. A bow-forming decoration, comprising:

a tubular netting having pliable, elongated strands of synthetic plastic material intersecting one another and forming an open-work pattern having open spaces, said strands being joined at their points of intersection,

said tubular netting extending longitudinally along an axis from one axial end region of the netting to an opposite axial end region thereof, said netting having a circumfer-

entially-complete tubular central region intermediate said end regions and extending circumferentially completely about said axis,

said strands having stationary end portions at said one axial end region that are gathered in a common bunch, and



said strands having movable end portions at said opposite axial end region that are movable toward said common bunch and form a decorative bow.

4,840,823

PLASTIC FILM PACKAGING MATERIAL

Makoto Chigami; Sumio Ogihara, both of Kanagawa; Hiroshi Hoaki, Tokyo; Tomonobu Kondo, Chiba, and Masao Okamura, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Frontier; Nippon Unicar Kabushiki Kaisha and Nittetsu Kougyo Kabushiki Kaisha, Japan

Filed Oct. 9, 1987, Ser. No. 106,268

Int. Cl.[4] B65D *81/24*; B32B *7/02*; C08L *23/04*

U.S. Cl. 428—35.5 **8 Claims**

1. A plastic film packaging material comprising 100 weight parts of a polyethylene resin and, 5 to 100 weight parts of an additive comprising a silica containing naturally porous material which is hydrophillic and which has a pore diameter of 15–200 A, a specific surface area of 110 to 130 m^2/g, voids of 40 to 50% and a specific gravity of about 1.2.

4,840,824

STAIRTREAD FACINGS AND A CO-EXTRUSION METHOD FOR THEIR MANUFACTURE

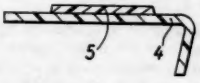
Robert J. Davis, Stockport, United Kingdom, assignor to Ferodo, Inc., Manchester, England

Filed Oct. 13, 1987, Ser. No. 111,583

Claims priority, application United Kingdom, Oct. 14, 1986, 8624653

Int. Cl.[4] B32B *3/10, 5/20*; B29C *67/22, 47/06*

U.S. Cl. 428—67 **11 Claims**



1. A stairtread facing coxtruded to provide a locating member and one or more integral strips of non-slip friction material, wherein said locating member is shaped to locate said one or more strips on a stairtread, and wherein said locating member and said one or more strips have different properties.

4,840,825

STONE TILES

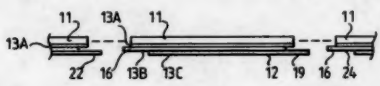
Emilios Aristodimou, Colchester Mill Hotel, East Street, Colchester, Essex, CO1 2VA, England

Filed May 19, 1987, Ser. No. 51,930

Claims priority, application United Kingdom, May 21, 1986, 8612355

Int. Cl.[4] B32B *3/06*

U.S. Cl. 428—77 **6 Claims**



1. A tile comprising in combination:

a layer of a natural stone material and a substrate layer of essentially the same shape as said natural stone layer;

said substrate layer being adhered to a face of said stone layer and being relatively non-brittle as compared to the stone material;

first and second projecting tongues being defined by said substrate layer;

said first and second tongues projecting along two adjacent edges of the tile in a plane generally parallel to the major surface of the stone layer;

first and second grooves having complementary forms to said first and second tongues respectively and being defined by said substrate layer along respective opposed edges of the tile to receive the respective tongues of other tiles during the fixing thereof; and

a tab which projects from the substrate layer beyond the adjacent edge of said stone layer which said tab projects in the plane of the exposed substrate major surface, a corresponding groove being formed in the substrate along the opposed edge of the tile.

4,840,826

FIBER REINFORCED PLASTIC SOLID OR HOLLOW MOLDED ARTICLE

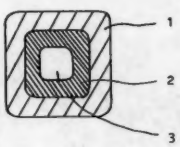
Yoshikazu Shirasaki, and Kenichi Inuzuka, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Sep. 22, 1987, Ser. No. 99,726

Claims priority, application Japan, Sep. 22, 1986, 61-224195

Int. Cl.[4] F16L *11/00*

U.S. Cl. 428—36.91 **6 Claims**



1. A fiber reinforced plastic solid or hollow molded article which comprises,

a plastic core part reinforced with inorganic fibers (A); and

a plastic sheath part reinforced with polyenthylene filaments having high tenacity (B), wherein

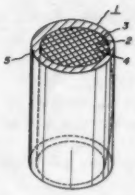
the volume of the fibers (A)/filaments (B) is 75/25 to 95/5 and wherein the high tenacity polyethylene filaments have a tensile strenght of at least 20 g/denier and a tinsel modulus of at least 500 g/denier.

4,840,827

CERAMIC HONEYCOMB STRUCTURAL BODIES AND METHOD OF PRODUCING THE SAME

Isao Mizutani; Toshihiko Hijikata, and Takashi Harada, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 8, 1988, Ser. No. 165,464
Claims priority, application Japan, Mar. 16, 1987, 62-37125[U]
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 16 Claims



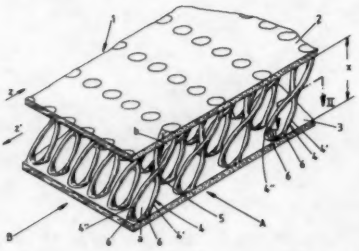
1. A ceramic honeycomb structural body having a plurality of longitudinal channels formed therein by a plurality of intersecting longitudinal partition walls, comprising an extrusion molded main ceramic honeycomb structural body having an outer diameter smaller than a predetermined dimension, and a coating layer formed on an outer periphery of said main body, so as to provide said main body with an outer diameter having a dimension within a predetermined dimensional tolerance of said predetermined dimension.

4,840,828

STRUCTURAL ELEMENT FORMED OF A RESIN-HARDENED VELOUR FABRIC AND FABRICATION METHOD

Wolfgang Böttger, Ködnitz; Kurt Biedermann, and Werner Pensel, both of Kulmbach, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,398
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723681
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—120 11 Claims



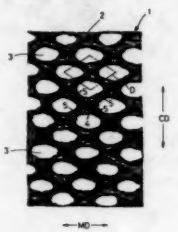
1. Structural element comprising a velour fabric formed of two generally parallel layers and intermediate ribs connected between and separating said layers, said intermediate ribs being formed of threads, said velour fabric being made of aramid fibers, carbon fibers, ceramic fibers or glass fibers, and a hardened resin impregnated within said velour fabric.

4,840,829

NONWOVEN FABRIC PATTERNED WITH APERTURES

Migaku Suzuki, Kawanoe; Satoshi Nozaki, Ehime; Shigeo Imai, Kawanoe; Makoto Ishigami, Kawanoe, and Toshio Kobayashi, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Dec. 29, 1987, Ser. No. 138,945
Claims priority, application Japan, Dec. 31, 1986, 61-312896
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—131 5 Claims



1. A nonwoven fabric that includes
a plurality of spaced apart apertures arranged in a pattern in said fabric, and
nonwoven fiber areas composed of individual fibers that are entangled together around said apertures, the improvement comprising that
(1) said apertures:
(a) being circular or elliptical in shape,
(b) each having a periphery that is definitely contoured and free of fluff,
(c) being spaced at least 1 mm from one another, and
(d) being formed solely by the action of a water jet against a web of non-woven fibers travelling over a patterned array of upstanding projections that are surrounded by water drainage openings, and
(2) said nonwoven fiber areas:
(a) having substantially no difference in thickness throughout its area,
(b) having a high fiber density and degree of entangling directly contouring each of the apertures so as to give improved strength and shape-stability,
(c) being substantially free of any fluff extending into said apertures, and
(d) having a strength requiring no addition of a binder.

4,840,830

POLYESTER FILM FOR MAGNETIC RECORDING TAPE

Seiji Sakamoto, Machida, and Kiyoshi Yasumura, Yokohama, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 931,871, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 821,881, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 599,332, Apr. 12, 1984, abandoned. This application Oct. 6, 1987, Ser. No. 105,977
Claims priority, application Japan, May 2, 1983, 58-77927
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—141 5 Claims

1. A polyester film, comprising 0.05–1% by weight of particles consisting essentially of calcium and phosphorus, formed by the reaction of a calcium compound, a trivalent phosphorus compound and a pentavalent phosphorus compound during polymerization, and in which the number, H_2, of the secondary interference fringes (number/mm^2) and the average center-line roughness, R_a, (μm) satisfy the following relationships:

$$H_2 < 25 \quad (1)$$

$$0.001 \leqq R_a \leqq 0.025 \quad (2)$$

$$R_a > 2\times10^{-4}H_2+0.01 \quad (3)$$

and wherein the total amount of the calcium compound is 0.3–1 mol % based on the total amount of the acid components in the polyester film, the molar ration of the phosphorus compound to the calcium compound of 0.7–3, the amount of calcium and phosphorus per particle is about 1–15% by weight, and the molar ratio of the pentavalent to the trivalent phosphorus compound is 1–20, and wherein the trivalent phosphorus compound is selected from the group consisting of phosphorus acid, trialkylesters of phosphorus acid, and partial alkylester of phosphorus acid, and the pentavalent phosphorus compound consists of a mixture of phosphoric acid and a trialkylester of phosphoric acid and a partial alkylester of phosphoric acid.

4,840,831

PACKING MATERIAL FOR RELATIVELY RIGID OBJECTS AND METHOD FOR PACKING ELECTRODES

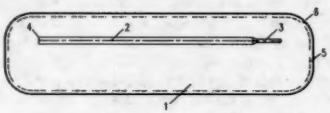
Petrus E. G. Schraven, Wijchen, and Jan A. M. H. Jacobs, DB Druten, both of Netherlands, assignors to Smitweld B.V., Netherlands

Filed Apr. 21, 1987, Ser. No. 40,958

Claims priority, application Netherlands, Apr. 29, 1986, 8601090

Int. Cl.[4] B32B *15/08, 15/12, 29/00*

U.S. Cl. 428—152 **4 Claims**



1. Packaging material for relatively rigid objects, the packaging material comprising:

a creped basic layer of paper or plastic having a stretch capability of substantially 20–80 percent;

a first sheet of metal foil positioned adjacent to one face of the creped basic layer;

a first polyethylene-based adhesive layer positioned between and contiguous to the creped basic layer and the first sheet of metal foil;

a second sheet of metal foil positioned adjacent to a second face of the creped basic layer;

a second polyethylene-based adhesive layer positioned between and contiguous to the creped basic layer and the second metal foil;

a first layer of polyethylene plastic material positioned contiguous to the first metal foil sheet so that the first metal foil sheet lies between the first layer of plastic material and the first adhesive layer; and

a second layer of polyethylene plastic material positioned contiguous to the second metal foil sheet so that the second metal foil sheet lies between the second layer of plastic material and the second adhesive layer.

4,840,832

MOLDED AUTOMOBILE HEADLINER

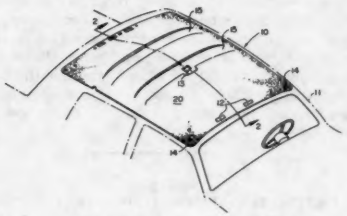
Paul L. Weinle, Charlotte; Vernon C. Smith, Huntersville; Christopher H. Gardner, Charlotte; Clarence A. Peoples, Jr., Rockwell, all of N.C., and Matthew R. Pierce, Troy, Mich., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Jun. 23, 1987, Ser. No. 65,898

Int. Cl.[4] B32B *3/00, 3/26*

U.S. Cl. 428—156 **25 Claims**

15. A vehicle headliner adapted to be mounted adjacent a vehicle roof so as to underlie the roof and shield the same from view, and characterized by being of a highly deformable, resilient construction to facilitate installation in the vehicle and by providing excellent sound absorption properties, said headliner comprising a panel formed of a batt of polymeric fibers compressed and molded into a predetermined contoured concave shape of varying thickness, and having an elastic memory of the molded shape, the polymeric fibers of said batt comprising a blend of relatively high melting thermoplastic polymer fibers and relatively low melting potentially adhesive thermo-



plastic binder fibers forming a multiplicity of fiber-to-fiber bonds at the fiber intersections to impart to the panel self-supporting molded rigidity to allow the headliner to retain its shape in the installed condition in the vehicle yet rendering the panel highly deformable and resilient to allow it to be flexed or bent during installation and to thereafter resiliently recover to its original molded shape.

4,840,833

INK COMPOSITION AND A PRESSURE SENSITIVE REPRODUCING

Zenshiro Iijima, Abiko, Japan, assignor to Adger Kogyo Co., Ltd., Soka City, Japan

Filed Feb. 18, 1988, Ser. No. 157,253

Claims priority, application Japan, Feb. 19, 1987, 62-36406; Feb. 19, 1987, 62-36407

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—207 **4 Claims**

1. An ink composition comprising a fine powder of white colored water soluble alkali salt of aliphatic sulfate selected from the group consisting of lauryl sulfate, myristil sulfate, cetyl sulfate and stearil sulfate dispersed in a monohydric alcohol as a coloring matter, wherein the ratio of the monohydric alcohol to the alkali salt of aliphatic sulfate of 50–2000 parts by weight of the monohydric alcohol per 100 parts by weight of the alkali salt of aliphatic sulfate.

4,840,834

ELECTROSTATIC RECORDING MATERIAL

Yasuharu Onogi; Akinori Oka; Masakatsu Nagatomo; Takumi Kondo, and Kouji Mizumoto, all of Miyazaki, Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 27,818

Claims priority, application Japan, Mar. 19, 1986, 61-61177

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—211 **3 Claims**

1. An electrostatic recording material which comprises a support coated in sequence with a conductive layer and a recording layer composed of a dielectric resin and a pigment, wherein the ratio of dielectric resin to pigment is in the range of from 5:5 to 8L2, and wherein at least 2 percent of the pigment component in said recording layer is made of an aluminum hydroxide powder having an average particle size of 1–20 μm.

4,840,835

HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM

Seiji Ueyama, Hirakata, and Hiroyasu Onoe, Ikoma, both of Japan, assignors to General Company Limited, Japan

Filed Jul. 29, 1985, Ser. No. 759,859
Claims priority, application Japan, Mar. 12, 1985, 60-47441
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—212 6 Claims

1. A heat-sensitive transferring recording medium which comprises a substrate, a heat-sensitive releasing layer overlying the substrate, and a heat-sensitive transferring ink layer overlying the heat-sensitive releasing layer, wherein the heatsensitive releasing layer is easily melted when heated and the heat-sensitive transferring ink layer becomes cohesive when heated and has a melt viscosity that is higher than that of the heat-sensitive releasing layer.

4,840,836

STRETCHED, COMPOSITE POLYESTER FILMS USABLE PARTICULARLY FOR GRAPHIC ARTS

Marcel Eyraud, Lyons, France, assignor to Rhone-Poulenc Films, Courbevoie, France

Continuation of Ser. No. 6,544, Feb. 25, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 262,172
Claims priority, application France, Apr. 15, 1985, 85 05841
Int. Cl.[4] B32B 7/02, 27/08, 27/36
U.S. Cl. 428—213 6 Claims

1. A thick, composite graphic polyester arts film with a thickness of between 40 and 300 microns, drawn, crystalline or semi-crystalline, comprising a drawn layer (A) of thickness e_1, layer (A) being essentially unfilled and being covered on at least one of its faces with a thin drawn layer (B), drawn layer (B), of thickness e_2, having an overall roughness greater than 0.3 micron and being filled with inert particles, the volume median diameter of the filler being at least equal to the thickness of the layer, wherein:

(i) the ratio of the thicknesses of the layers (B) and (A) denoted by e_2/e_1 is lower than 5%; and

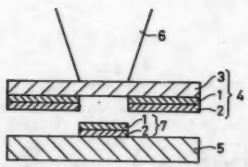
(ii) the percentage of scattered light transmitted from the composite film is lower than 7.

4,840,837

HEAT TRANSFER MEDIUM

Noriatsu Tanaka; Masami Tokunaga; Tsuyoshi Tanaka; Satoshi Koyama, and Keiichi Kikuchi, all of Kanagawa, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,067
Claims priority, application Japan, Jul. 2, 1987, 62-166180
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—216 15 Claims



1. A heat transfer medium comprising a base material having thereon in order outwardly from said base material:

(a) a colorless or light color heat-fusible transfer layer (A) comprisigg from about 55 to 95 wt% of a wax an from about 5 to 45 wt% of a thermoplastic resin compatible with said wax, based on the whole amount of layer; and

(b) a heat-softenable ink layer (B) comprising from about 50 to 90 wt% of a thermoplastic resin incompatible with said wax in layer (A) and having adhesion upon heating, from about 3 to 30 wt% of a heat-fusible lubricant selected from the group consisting of a natural wax, a petroleum wax, a synthetic wax, a fatty acid, a fatty acid amide, a fatty acid ester, a fatty acid ketone, an aliphatic alcohol, a partial ester of a fatty acid and a polyhydric alcohol, a nonionic ester series active agent, a block polymer of ethylene oxide and propylene oxide, and a mixture thereof, and a coloring agent, based on the whole amount of layer (B);

the viscosity of layer (A) being from about 100 c.p. to 1,000 c.p. at a temperatrue 20° C. higher than the melting point of layer (A) shown by a differential scanning calorimeter.

4,840,838

HIGH TEMPERATURE FILTER FELT

Kurt H. Wyss, Meyrin, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 8, 1988, Ser. No. 270,783
Int. Cl.[4] B01D 39/08, 39/16; B32B 5/06; D04B 1/16
U.S. Cl. 428—234 4 Claims

1. A filter felt suitable for long term use at temperatures up to 300° C., comprising a supporting scrim and a batt of staple fibers entangled into the scrim,

said filter felt having a weight per square meter in the range from 400 g to 900 g; an air permeability in the range from 30 to 400 liters per square decimeter per minute at 20 mm water differential pressure; a tensile strength in the machine and cross-direction of greater than 100 Newtons per 25 mm width when measured at 25° C.; and tensile strengths of greater than 50 Newtons per 25 mm width in the machine direction and 100 Newtons per 25 mm width in the cross-direction when measure at 200° C.; an initial modulus in the machine direction greater than 125 Newtons per 25 mm width at 200° C., and an elongation of less than 20% when stressed at 50 Newtons per 25 mm width at 200° C.; an abrasion weight loss of less than 13 percent by the Martindale abrasion test after 10,000 cycles.

said supporting scrim having a weight range from 100 to 550 g per square meter, said supporting scrim comprising an intermeshed continuous filament bulked (machine direction) yarn having a linear density in the range from 1,000 to 5,000 dtex, containing from 40 to 75% by weight of glass fibers having a linear density in the range from 0.2 to 2 dtex/filament and 25 to 60% by weight of poly(tetrafluoroethylene) fibers having a linear density in the range from 3 to 10 dtex/filament, and a cross-machine direction continuous filament yarn having a linear density in the range of 150 to 5,000 dtex and selected from the class consisting of glass, aramid, poly(tetrafluoroethylene), polyacrylate, polyphenylene sulfide or blends of these fibers or the bulked yarn previously described as the machine direction yarn,

said batt of staple fibers having the weight range from about 300 to 800 g per square meter, the staple fibers of said batt having a linear density from 0.2 to 20 dtex/filament, and being selected from the class consisting of aramids, poly(tetrafluoroethylene), polyphenylene sulfide, polyacrylates, polyketones, polyoxyketones, glass, and blends of the above.

4,840,839

THERMOPLASTIC MASS PASSED BETWEEN ROLLERS

Francisco C. Codina, Sant Just Desvern, Spain, assignor to Texsa, S.A., Barcelona, Spain

Filed Apr. 27, 1987, Ser. No. 86,291
Claims priority, application Spain, May 5, 1986, 554644
Int. Cl.[4] C08K 5/01, 3/34, 3/36; B32B 5/16
U.S. Cl. 428—240 15 Claims

1. A thermoplastic mass comprising from about 8 to 60 percent of a highly aromatic oil having a saturate content of below 15 percent by weight, from 1 to 50 percent by weight of chlorinated polyethylene having a chlorine content lying between 20 and 95 percent by weight, and from about 20 to 90 percent by weight of a finely divided powder filler.

4,840,840

COMPOSITE MATERIAL

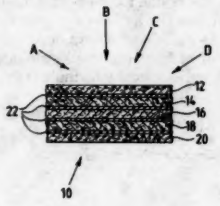
Nigel Flynn, and Nigel Clark, both of Bolton, England, assignors to Lantor (UK) Limited, Bolton, England

Filed Dec. 4, 1987, Ser. No. 128,901

Claims priority, application United Kingdom, Dec. 10, 1986, 8629566

Int. Cl.[4] B32B 5/16

U.S. Cl. 428—283 10 Claims



1. A composite microwave absorbent material comprising a plurality of layers of fabric, adjacent layers of said fabric being joined together, each said layer containing a comminuted conductive material, the amount of conductive material being different in successive fabric layers.

4,840,841

DISPOSABLE ONE-PIECE SEAT LINER

John J. Madsen, 138 S. 35th St., Belleville, Ill. 62223

Filed Mar. 15, 1988, Ser. No. 168,488

Int. Cl.[4] B32B 27/00; A61F 13/16

U.S. Cl. 428—286 14 Claims

1. A one-piece disposable seat liner for seats having a bottom, back, sidewalls and arms formed from a uniform layer of absorbent cellulosic fibers possessing sufficient integrity that it does not abrade during normal use bonded to a flexible moisture repellant backing sheet, said seat liner comprising a pocket formed from an upper and a lower section with the upper section sized to cover the back of the seat with the side edges folding forward along the sidewalls of the seat and the lower section sized to cover the bottom of the seat with the side edges folding upward along the arms of the seat joined by a fold line at the junction between the upper and lower sections.

4,840,842

ABRASIVE TAPE

Nobutaka Yamaguchi; Masaaki Fujiyama; Masami Suzuki, and Yasuyuki Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

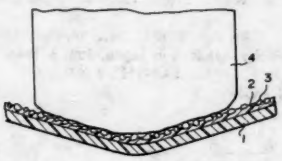
Filed Sep. 25, 1987, Ser. No. 100,857

Claims priority, application Japan, Sep. 25, 1986, 61-226459

Int. Cl.[4] G11B 5/702

U.S. Cl. 428—323 21 Claims

1. An abrasive tape comprising a flexible substrate, and an abrasive layer overlaid on said flexible substrate by applying an abrasive coating composition containing abrasive grains and a binder onto said flexible substrate and drying the applied abrasive coating composition, wherein said binder contains a vinyl chloride resin have a $—SO_3M$ group and a number average molecular weight within the range of 15,000 to 60,000, where M represents Li, Na or K, and an epoxy group; wherein the ratio of said epoxy group to said vinyl chloride resin is within the range of 0.1 to 10 wt % and the amount



of said vinyl chloride resin used is within the range of 15 to 50 parts to 100 parts of said abrasive grains.

4,840,843

MAGNETIC RECORDING MEDIUM

Kunihiko Sano; Makoto Nagao; Akira Nahara; Yasuo Nishikawa, and Hiroyuki Iwasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,377

Claims priority, application Japan, Oct. 17, 1986, 61-247109; Jan. 19, 1987, 62-9540; Jan. 20, 1987, 62-10179; Mar. 6, 1987, 62-51659

Int. Cl.[4] G11B 5/64

U.S. Cl. 428—336 12 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a thin magnetic metal film and a protective layer mainly comprising carbon having a graphite structure containing at least one element selected from the group consisting of Mn, Mo, Nb, Ta, Ti, V, Cr and W, wherein said at least one element is present in an amount of from 0.5 to 10 wt. % and wherein the thickness of said protective layer is from 10 to 1,000 Å.

4,840,844

MAGNETIC RECORDING MEDIUM

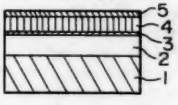
Masaaki Futamoto, Kanagawa; Yukio Honda, Fuchu; Shinichiro Saito, Tokyo; Takashi Nishimura, Kokubunji; Kazuetsu Yoshida, Kodaira; Toyoji Okuwaki, Tokyo; Hitoshi Iwata, Kumagaya; Hiroyuki Suzuki, Kokubunji; Kazushige Imagawa, Koganei; Hideo Daimon; Osamu Kitakami, both of Toride, and Hideo Fujiwara, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Maxell Ltd., both of Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,661

Claims priority, application Japan, Jun. 2, 1986, 61-125777; Mar. 30, 1987, 62-77857

Int. Cl.[4] G11B 5/64

U.S. Cl. 428—336 18 Claims



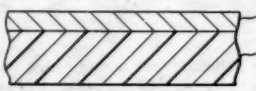
1. A magnetic recording medium which comprises a non-magnetic substrate, a magnetic film formed on the substrate and a protective film having a thickness of 50 to 2,000 Å provided on the magnetic film, the protective film containing at least one selected element selected from the group consisting of B and C as a constituent element, and the concentration of the selected element increasing throughout the protective film from the interface side with the magnetic film toward the opposite face side in a continuous manner.

4,840,845

MAGNETIC RECORDING MEDIUM HAVING PERPENDICULAR MAGNETIC ANISOTROPY

Hideki Tamai, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 4, 1987, Ser. No. 58,040
Claims priority, application Japan, Jun. 6, 1986, 61-132551
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—336 15 Claims



1. A magnetic recording medium having at least a first recording layer which is a source of perpendicular magnetic anisotropy and which comprises a magnetic film of an Fe-Ti or Fe-Ti-Cr alloy fabricated on a substrate, said alloy comprising:

(a) 15–21 atomic percent of Ti and the balance of Fe, or

(b) 5–21 atomic percent of Ti, 5–15 atomic percent of Cr and the balance of Fe,

to have a structure of mixed phase comprising an amorphous phase and isolated crystalline grains with bcc phase surrounded by said amorphous phase.

4,840,846

HEAT-ADHESIVE COMPOSITE FIBERS AND METHOD FOR MAKING THE SAME

Shozo Ejima, Moriyama; Taizo Sugihara, Omihachiman, and Morio Abe, Shiga, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 10, 1987, Ser. No. 94,891
Claims priority, application Japan, Sep. 12, 1986, 61-214145
Int. Cl.[4] D02G 3/00
U.S. Cl. 428—373 7 Claims

1. A heat-adhesive composite fiber comprising a core portion and a sheath portion,

(A) said core portion being of the side-by-side type composite structure comprising two core components made of different polypropylele base polymers present in a composite ratio of 1:2 to 2:1, one of said core components having a Q value, expressed in terms of weight-average molecular weight/number-average mollecular weight, equal to or higher than 6, and the other core component having a Q value equal to or lower than 5, and

(B) said sheath portion satisfying at least the following requirements (i) and (ii);

(i) said sheath portion comprising a sheath component of a polyethylene base polymer having a melting point lower by at least 20° C. than the lower of the two melting points of said two core components;

(ii) said sheath portion covering said core portion in a proportion of 25 to 55% by weight based on the total weight of said sheath portion and said core portion.

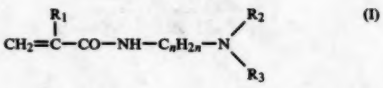
4,840,847

CONJUGATE FIBERS AND NONWOVEN MOLDING THEREOF

Tadayuki Ohmae; Tadashi Sakurai, and Kouichiro Asao, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 2, 1988, Ser. No. 189,439
Claims priority, application Japan, Feb. 4, 1988, 63-25466
Int. Cl.[4] D02G 3/00
U.S. Cl. 428—373 3 Claims

1. A conjugate fiber obtained by melt spinning (A) a crystalline poly-α-olefin and (B) an ethylene copolymer containing from 40 to 95% by weight of an ethylene unit and from 5 to 60% by weight of at least one dialkylaminoalkylacrylamide comonomer unit represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each represents an alkyl group having from 1 to 4 carbon atoms; and n represents an integer of from 2 to 5, said ethylene copolymer having a melt index of from 10 to 1000 g/10 min as measured according to JIS K-6760, either by aligning the components (A) and (B) in parallel or by aligning the component (A) as a core and the component (B) as a sheath.

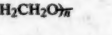
4,840,848

THERMAL TRANSFER RECORDING MEDIUM

Kunihiro Koshizuka, and Takao Abe, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,243
Claims priority, application Japan, Jan. 27, 1987, 62-16870
Int. Cl.[4] B41M 5/00
U.S. Cl. 428—413 15 Claims

1. A thermal transfer recording medium having a thermal transfer colorant layer provided on a support, and wherein said thermal transfer colorant layer contains a colorant, a polyoxyethylene type compound having a moiety represented by the following formula in the molecule:



wherein n is an integer of at least 2; and

at least one modified silicon compound selected from the group consisting of an alkyl-modified silicon compound, a polyether-modified silicone compound, an amino-modified silicon compound, an alcohol modified silicone compound, a mercapto-modified silicone compound, a carboxyl-modified silicone compound and an epoxy-modified silicone compound.

4,840,849

LAMINATED ARTICLE FROM MOLDING COMPOSITIONS OF A CHLOROSULFONATED POLYOLEFIN AND A FLUORINE-CONTAINING ELASTOMER

Yukihiko Harada; Tatsushi Nakagawa; Junichiro Kanesaka, and Yousuke Kaneshige, all of Yamaguchi, Japan, assignors to Tosoh Corporation, Japan

Filed Aug. 20, 1987, Ser. No. 87,189
Claims priority, application Japan, Aug. 20, 1986, 61-192787
Int. Cl.[4] B32B 27/06, 27/00; C08L 23/16
U.S. Cl. 428—419 4 Claims

1. A laminated article obtained by molding a chlorosulfonated polyolefin composition and a fluorine-containing elastomer composition, wherein said chlorosulfonated polyolefin composition contains (a) a lead compound present in an amount of from 2 to 100 parts by weight based on 100 parts by

weight of the chlorosulfonated polyolefin composition, and (b) a peroxide present in an amount of from 0.5 to 20 parts by weight based on 100 parts by weight of the chlorosulfonated polyolefin composition, and wherein said chlorosulfonated polyolefin contains from 10 to 60 wt % of chlorine and from 0.3 to 3.0 wt % of sulfur.

4,840,850

EMISSIVE COATING FOR X-RAY TARGET

Clarence O. Clark, Brown Deer, Wis., and Jauwhei Hong, Elk Grove, Ill., assignors to General Electric Company, N.Y.

Filed May 9, 1986, Ser. No. 861,523
Int. Cl.[4] B05D *5/06*; B32B *15/04*
U.S. Cl. 428—471 9 Claims

1. A process for producing an emissive coating on a substrate of an X-ray target comprising:

mechanically mixing from about 70 mole percent to about 90 mole percent titanium dioxide with from about 30 mole percent to about 10 mole percent calcium oxide to produce a mixture;

sintering said mixture at a temperature below a melting temperature thereof to produce a ceramic mass;

grinding and screening said ceramic mass to produce a ceramic powder;

applying said ceramic powder to said substrate;

baking said substrate and ceramic powder at a temperature and for a time effective to fuse said ceramic powder to said substrate and said temperature being below a temperature which permits emission from the substrate which reacts with said coating.

4,840,851

SURFACE COATED ARTICLE, PROCESS AND MEANS FOR THE PREPARATION THEREOF AND USE THEREOF

Carl G. Gölander, Stockholm; Erik S. Jönsson, Nässjö, and Todorka G. Vladkova, Sofia, all of Sweden, assignors to Ytkemiska Institutet, Stockholm, Sweden

PCT No. PCT/SE85/00376, § 371 Date May 9, 1986, § 102(e) Date May 9, 1986, PCT Pub. No. WO86/02087, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 27, 1985, Ser. No. 862,504
Claims priority, application Sweden, Sep. 28, 1984, 84048669
Int. Cl.[4] B32B *27/32*
U.S. Cl. 428—523 29 Claims

1. A surface coated article comprising (i) a substrate with (ii) a cured polyethylene oxidebased coating thereupon consisting essentially of polyethylene oxide chains, each of which has one end that is unmodifed, free and pendant from said substrate and another that has been crosslinked, via one or more radiation curable, ethylenically unsaturated group(s) as part of said polyethylene oxide chain, to other chains by a cross-linking agent with two or more radiation curable, ethylenically unsaturated groups reactive with the ethylenically unsaturated groups of the polyethylene oxide chains, the surface coated article being produced by the process of (i) cross-linking by means of radiation, and (ii) swelling the substrate prior to said cross-linking operation,

the proportions between polyethylene oxide and crosslinking agent being such that an adherent, cured coating is obtained.

4,840,852

ALUMINUM ALLOY VEHICULAR MEMBER

M. Elise Hyland, Forest Hills, and Warren H. Hunt, Jr., Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 794,467, Nov. 4, 1985, abandoned, and Ser. No. 66,953, Jun. 29, 1987. This application Jun. 30, 1988, Ser. No. 213,830
Int. Cl.[4] B32B *15/20*
U.S. Cl. 428—654 42 Claims

40. A plural panel vehicular structural member having spaced general parallel inner and outer panels connected along peripheral portions thereof, said panels comprised of an alloy consisting essentially of, by weight percent, 0.5 to 0.85% Si, 0.25 to 0.48 Mg, 0.05 to 0.40% Fe, 0.7 to 1.1% Cu, less than 0.08% Mn, the balance essentially aluminum and incidental elements and impurities and said inner panel being deep drawn product and formed in mild steel forming dies to produce said deep drawn product having a shape substantially identical to mild steel formed in said dies.

4,840,853

SURFACE STRUCTURE OF ALN SUBSTRATE AND A PROCESS FOR PRODUCING THE SAME

Satoshi Iio, and Akiyasu Okuno, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 9, 1987, Ser. No. 30,253
Claims priority, application Japan, Mar. 8, 1986, 61-51213
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—698 10 Claims

1. A surface structure for a AlN substrate comprising:

an AlN substrate,

an intermediate layer disposed on the AlN substrate, and

a metallized layer disposed on said intermediate layer, said intermediate layer comprising at least aluminum, nitrogen and oxygen.

4,840,854

REINFORCED PLATE-LIKE SINTERED BODIES

Takao Kojima, and Tetsusyo Yamada, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 749,457, Jun. 27, 1985, abandoned. This application Sep. 11, 1987, Ser. No. 97,343
Claims priority, application Japan, Jun. 27, 1984, 59-130938
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—698 6 Claims

1. A reinforced plate-like laminated sintered body produced by the steps:

(a) providing a green laminate comprising an Al_2O_3-based surface layer comprising ZrO_2 at least partly over one surface of a base material layer, the thickness ratio of said surface layer with respect to said base material layer being in the range of 1/100 to 20/100 and the laminate having a ratio of shrinkage moduli

$$\frac{l_0/l_1}{l_0'/l_1'}$$

where l_0/l_1 is the shrinkage modulus of the base material layer when sintered alone; l_0'/l_1' is the shrinkage modulus of the surface layer when sintered alone; l_0 is a green length before sintering of the base material layer, l_1 is a length after sintering of the base material layer; l_0' is a green length before sintering of the surface layer; and l_1' is a length after sintering of the surface layer, and

(b) simultaneously sintering said laminate.

4,840,855

BATTERY LIFE EXTENDER

Michael Foti, 1919 Lenox Ave., East Meadow, N.Y. 11554, and James Embry, 1930 S. Westwood #14, Mesa, Ariz. 85202

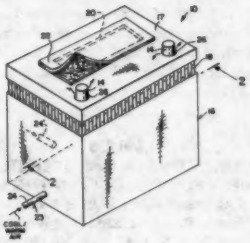
Filed Mar. 28, 1988, Ser. No. 174,184
Int. Cl.[4] H01M *10/50*
U.S. Cl. 429—120 10 Claims

1. A battery life extender which comprises:

(a) a housing disposed around the battery with terminals of the battery extending through top of said housing so that battery clamps can be attached thereto, said housing having an access opening in the top thereof;

(b) means for stabilizing temperature of the battery within

said housing during hot and cold weather conditions so as to extend operating life of the battery; and



(c) a removable cover sized to fit over said access opening in the top of said housing so that the battery can be serviced without having to remove said housing or any part thereof.

4,840,856

ALLYL GROUP-CONTAINING OLIGOETHYLENEOXYPOLYPHOSPHAZENES, PROCESS FOR THEIR PREPARATION, AND THEIR USE

Yoshifumi Nakacho; Yuji Tada, and Sinichi Yamada, all of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

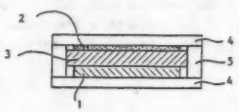
PCT No. PCT/JP87/01028, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988, PCT Pub. No. WO88/05064, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 24, 1987, Ser. No. 245,440

Claims priority, application Japan, Dec. 26, 1986, 61-310739

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—192 **3 Claims**



1. An alkali metal secondary battery comprising a positive electrode in the form of a layer of V_2O_5, a negative electrode made of a substance capable of occluding and releasing an alkali metal ion, and an electrolyte comprising a complex of the polyphosphazene with an alkali metal salt.

4,840,857

GALVANIC PRIMARY ELEMENT WITH NEGATIVE LITHIUM ELECTRODE

Subash-Chander Nijhawan, Kronberg; Horst Daniel, Hofheim, and Welf Dennstedt, Kelkheim, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,284

Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714655

Int. Cl.[4] H01M *6/16*

U.S. Cl. 429—197 **10 Claims**

1. In a galvanic primary element having a negative lithium electrode and a positive metal oxide electrode comprising CrO_x wherein $2 \leqq x \leqq 2.9$ and a non-aqueous electrolyte the improvement comprising:

interposing, as the sole barrier between said electrodes, an electronically non-conductive but lithium ion permeable

layer comprising the reaction product of lithium and CrO_x.

4,840,858

SECONDARY CELL

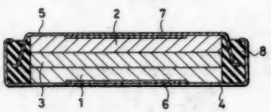
Nobuhiro Furukawa; Koji Nishio, and Noriyuki Yoshinaga, all of Hirakata, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 13, 1988, Ser. No. 206,056

Claims priority, application Japan, Jun. 12, 1987, 62-147496; Dec. 18, 1987, 62-322266

Int. Cl.[4] H01M *4/60, 6/16*

U.S. Cl. 429—197 **15 Claims**



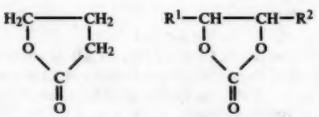
1. A rechargeable secondary cell comprising;

a positive electrode formed of a conductive polymer;

a negative electrode;

a separator disposed between the positive electrode and the negative electrode; and

an electrolyte including a mixed solvent of γ-butyrolactone and a cyclic carbonic ester compound expressed by the following chemical formulas.



γ-butyrolactone cyclic carbonic ester compound

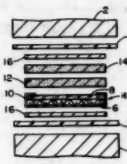
(where R^1 is a lower alkyl group having 1–3 carbon atoms and R^2 is a hydrogen atom or a methyl group, R^2 being a hydrogen atom, and R^1 being a group other than the methyl group.)

4,840,859

THERMAL BATTERY

Mark T. Williams, Owings Mills; Clinton S. Winchester, Beltsville, and Joseph D. Jolson, Baltimore, all of Md., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 16, 1986, Ser. No. 874,415
Int. Cl.[4] H01M 4/60
U.S. Cl. 429—212 13 Claims



1. A thermal battery comprising at least one electrochemical cell comprising an anode of alkali metal, alkaline earth metal or alloys thereof, a fusible salt electrolyte, a fluorocarbon polymer or fluorochlorocarbon polymer depolarizer, and means for heating the cell to melt the electrolyte.

4,840,860

MULTIACTIVE ELECTROPHOTOGRAPHIC ELEMENT

William J. Staudenmayer, Pittsford; David S. Weiss, Rochester, and Joseph A. Pavlisko, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,822
Int. Cl.[4] G03G 5/05
U.S. Cl. 430—59 4 Claims

1. In an electrophotographic element comprising: an electrically conductive support; a charge-generation layer comprising a photoconductive material sensitive to visible or infrared radiation; and a charge-transport layer containing a triarylamine charge-transport material,

the improvement wherein the charge-transport layer comprises a mixture of a polycarbonate comprising poly[2,2-bis(4-hydroxyphenyl)propane carbonate] and a polyester formed from 4,4'-(2-norbornylidene)diphenol and terephthalic and azelaic acids, and the weight ratio of the polycarbonate to the polyester is in the range of 9:1 to 3:7.

4,840,861

MULTIACTIVE ELECTROPHOTOGRAPHIC ELEMENT

William J. Staudenmayer, Pittsford; David S. Weiss, Rochester, and Joseph A. Pavlisko, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,835
Int. Cl.[4] G03G 5/05
U.S. Cl. 430—59 3 Claims

1. In an electrophotographic element comprising: an electrically conductive support; a charge-generation layer comprising a photoconductive material sensitive to visible or infrared radiaton; and a charge-transport layer containing a triarylamine charge-transport material,

the improvement wherein the charge-transport layer comprises a mixture of a polycarbonate comprising poly[2,2-bis(4-hydroxyphenyl)propane carbonate] and a polyester formed from 2,2-bis(4-hydroxyphenyl)propane and terephthalic and isophthalic acids, and the weight ratio of the polycarbonate to the polyester is in the range of 9:1 to 3:7.

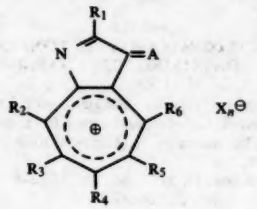
4,840,862

PHOTOCONDUCTIVE COMPOSITION HAVING AN AZAAZULENIUM SALT

Naonori Makino; Takanori Hioki; Yoshio Inagaki, and Seiji Horie, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1987, Ser. No. 82,462
Claims priority, application Japan, Aug. 7, 1986, 61-184325
Int. Cl.[4] G03G 5/09, 5/14
U.S. Cl. 430—75 19 Claims

1. A photoconductive composition comprising at least one azaazulenium salt represented by the following formula (I):



(I)

wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, a carboxyl group, a sulfonic acid group, a mercapto group, or a monovalent organic group; A represents a divalent organic group bonded by the double bond; $X\ominus$ represents an anionic group; n is the number of $X\ominus$ groups required to balance the positive charge; provided that each $X\ominus$ group may be bonded to any of R_1, R_2, R_3, R_4, R_5, R_6 or A to form an inner salt; and any two of R_2, R_3, R_4, R_5 and R_6 bonded to adjacent carbon atoms may be linked to form a substituted or unsubstituted aromatic carbocyclic or aromatic heterocyclic ring.

4,840,863

POSITIVELY CHARGEABLE TONER FOR USE IN DRY ELECTROPHOTOGRAPHY

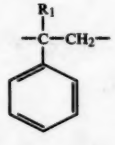
Akira Otsu, and Hiroshi Nagase, both of Tokyo, Japan, assignors to Fujikura Kasei Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,822
Claims priority, application Japan, Apr. 17, 1986, 61-87075
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—110 15 Claims

1. A positively chargeable toner for use in dry electrophotography, said toner comprising

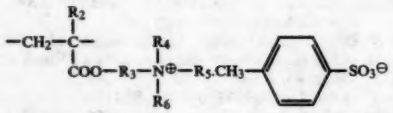
(A) a resinous binder composed of at least one resin selected from copolymers of styrene and/or alphamethylstyrene with alkyl (meth)acrylates, polyester resins and epoxy resins,

(B) 1 to 10 parts by weight, per 100 parts by weight of the resinous binder, of a copolymer containing a quaternary ammonium salt group, said copolymer having a weight average molecular weight of from 2,000 to 10,000 and composed of 65 to 97% by weight of recurring units represented by the formula



(I)

wherein R_1 represents a hydrogen atom or a methyl group, and 35 to 3% by weight of recurring units represented by the formula



(II)

wherein R_2 represents a hydrogen atom or a methyl group, R_3 represents an alkylene group, and each of R_4, R_5 and R_6 represents an alkyl group, and

(C) a coloring agent.

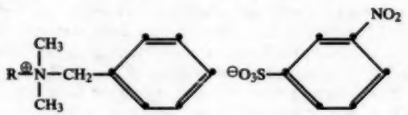
4,840,864

NEW ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING NEW CHARGE-CONTROL AGENTS

Douglas E. Bugner; Peter S. Alexandrovich; Lawrence P. DeMejo; Robert A. Guistina, and James H. Anderson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,344
Int. Cl.[4] G03G 9/10
U.S. Cl. 430—110 **4 Claims**

1. A dry, particulate, electrostatographic toner composition comprising a polymeric binder and a charge-control agent comprising a quaternary ammonium salt having the structure



wherein R is alkyl having 12 to 18 carbon atoms.

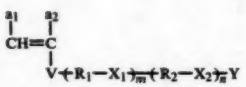
4,840,865

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Eiichi Kato; Shigeyuki Dan; Hiroshi Ishibashi; Kazuo Ishii, and Hidefuji Sera, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

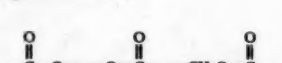
Filed Dec. 29, 1986, Ser. No. 946,728
Claims priority, application Japan, Dec. 26, 1985, 60-294550
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—114 **13 Claims**

1. A liquid developer for electrostatic photography comprising a non-aqueous solvent having electrical resistivity of not less than $10^9\Omega$-cm and a dielectric constant of not more than 3.5 having dispersed therein at least one resin, wherein said resin is a copolymer resin obtained by subjecting a solution containing (A) at least one of monofunctional monomer which is soluble in said solvent but insolubilized upon polymerization and (B) at least one of monomers having at least two polar groups and/or polar linking groups represented by formula (I):

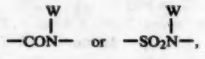


(I)

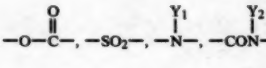
wherein V represents —O—,

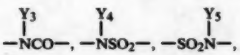


—SO_2—, —CONH—, —SO_2NH—,

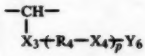


wherein W represents a hydrocarbon residue or $-(R_1-X_1)_m-(R_2-X_2)_n-Y$; Y represents a hydrogen atom, a hydrocarbon residue having from 1 to 18 carbon atoms, or a hydrocarbon residue having from 1 to 18 carbon atoms which is substituted with a halogen atom, —OH, —CN, —NH_2, —COOH, —SO_3H or PO_3H; X_1 and X_2 each represents —O—, —S—, —CO—, —CO_2—,





—NHCO$_2$—or —NHCONH—, wherein Y_1, Y_2, Y_3, Y_4 and Y_5 each has the same meaning as Y; R_1 and R_2 each represents a substituted or unsubstituted hydrocarbon residue having from 1 to 18 carbon atoms which may contain a moiety of



in its main chain, wherein X_3 and X_4 each has the same meaning as X_1 and X_2; R_4 represents a substituted or unsubstituted hydrocarbon residue having from 1 to 18 carbon atoms; and Y_6 has the same meaning as Y; a_1 and a_2 each represents a hydrogen atom, a hydrocarbon residue, —COOZ or —COOZ having a hydrocarbon residue attached at the carbonyl, wherein Z represents a hydrogen atom or a substituted or unsubstituted hydrocarbon residue; and m, n and p each represents O or an integer of from 1 to 4, to a polymerization reaction in the presence of a resin which is soluble in said solvent and contains no graft group polymerizable with said monomers, and wherein said at least one of monofunctional monomer which is soluble in said solvent but insolubilized upon polymerization and said at least one monomer having at least two polar groups and/or polar linking groups from particles and said particles have absorbed to the surface thereof as an outer particle resin said resin which contains no graft group polymerizable with said monomers.

4,840,866

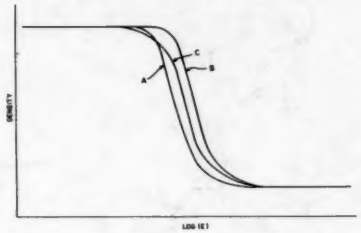
MICROCAPSULE IMAGING SYSTEM HAVING IMPROVED DYNAMIC RANGE

Kerry Kovacs; William Simpson, both of Centerville; Amy L. Burkholder, Kettering; Russell K. Messer, Franklin, and Teresa M. Thomas, Springfield, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 24, 1988, Ser. No. 172,624
Int. Cl.[4] G03C 1/46, 1/72, 5/00, 1/495
U.S. Cl. 430—138 **17 Claims**

1. A photographic material comprising a support having a layer of microcapsules thereon and an image-forming agent being associated with said microcapsules, said microcapsules including a mixture of a first subset of microcapsules and a second subset of microcapsules, said first and second subsets of microcapsules being associated with an image-forming agent for the same color, and said first subset of microcapsules pro-

viding a higher film speed than said second subset of microcapsules when said first and second subsets of microcapsules are



exposed to a broad band white light source and developed under identical conditions.

4,840,867

POSITIVE-WORKING RADIATION-SENSITIVE RECORDING MATERIAL WITH RADIATION-SENSITIVE 1,2-QUINONE DIAZIDE UNDERLAYER AND THICKER POSITIVE-WORKING RADIATION-SENSITIVE OVERLAYER

Andreas Elsaesser, Idstein, and Klaus Rode, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,070

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621376

Int. Cl.[4] G03C *1/495, 1/54, 1/74*

U.S. Cl. 430—156 **12 Claims**

1. A positive-working radiation-sensitive recording material comprising:

(a) a support;

(b) a first radiation-sensitive layer consisting essentially of an admixture of a radiationsensitive 1,2-quinone diazide in an amount to provide stabilizer action on a second radiation-sensitive layer, and a polymeric water-insoluble binder in an amount to provide film forming property to the first radiation-sensitive layer overlying said support; and

(c) a second radiation-sensitive layer, thicker than said first layer and overlying said first layer, consisting essentially of in admixture:

a compound which forms a strong acid under the action of actinic radiation selected from the group consisting of a diazonium, phosphonium, sulfonium and iodonium salts, halogen compounds and organometal-organohalogen combinations,

a compound which has at least one acid-cleavable C—O—C bond, said acid-forming and acid-cleavable compound present in amounts sufficient to increase the solubility of portions of said second layer exposed to actinic radiation so that an image can be developed, and

a polymeric binder in an amount sufficient to form a uniform layer

said recording material having an improved storage stability.

4,840,868

PHOTOSENSITIVE COMPOSITION BASED ON A DIAZONIUM SALT POLYCONDENSATION PRODUCT WITH AN ESTER POLYMER BINDER HAVING URETHANE GROUP

Georg Pawlowski; Guenter Hultsch, both of Wiesbaden, and Gerhard Mack, Walluf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

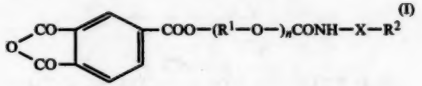
Filed Dec. 21, 1987, Ser. No. 135,448

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644163

Int. Cl.[4] G03C *1/60, 1/94*

U.S. Cl. 430—155 **13 Claims**

1. A photosensitive composition comprising (i) a photosensitive diazonium salt polycondensation product in an amount sufficient to render said composition photosensitive and (ii) a non-photosensitive polymeric binder with carboxyl side groups which is soluble or swellable in aqueous-alkaline solutions and which is present in an amount sufficient to impart layer-forming capability to a coating solution of said composition, said polymeric binder comprising the reaction product of a monofunctional intramolecular anhydride of an organic polycarboxylic acid with a polymer containing hydroxyl groups as the only functional groups capable of reaction with acid anhydrides, wherein the acid anhydride is a compound of the general formula (I)



(I)

wherein

R^1 is an alkylene group having from 2 to 6 carbon atoms,

R^2 is a hydrogen atom, a substituted or unsubstituted alkyl, cycloalkyl, aryl or heteroyl group,

X is a single bond or one of the groups CH_2, SO_2 and $O{=}P{-}R^3$,

R^3 is an alkyl, alkenyl or aryl group, and

n is a number from 1 to 6.

4,840,869

LIGHT-SENSITIVE COMPOSITION

Noriyasu Kita, Musashimurayama, and Kiyoshi Goto, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 867,628, May 27, 1986, abandoned, which is a continuation of Ser. No. 578,500, Feb. 9, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 83,879

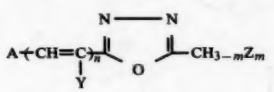
Claims priority, application Japan, Feb. 10, 1983, 58-19689

Int. Cl.[4] G03C *1/60, 1/68, 1/49, 1/727*

U.S. Cl. 430—191 **28 Claims**

1. A light-sensitive composition comprising

(a) a 2-halomethyl-1,3,4-oxadiazole compound of Formula I



wherein, Z is a fluorine atom, a chlorine atom or a bromine atom; Y is a hydrogen atom, a halogen atom, an alkyl group or an aryl group, wherein A is a substituted or unsubstituted benzofuryl-radical, m is an integer of from 1 to 3, and n is an integer of 0 or 1,

(b) a coloring agent, and

(c) a light sensitive resist forming compound,

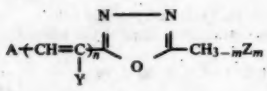
each of said 2-halomethyl-1,3,4-oxidiazole compound, said coloring agent and said light sensitive resist forming com-

pound being present in an amount effective to provide a photosensitive resist forming composition capable of providing print-out images.

12. A light sensitive composition comprising:

(a) a free radical producing agent, said free radical producing agent being a 2-halomethyl-1,3,4-oxadiazole compound of the following Formula:

Formula I



wherein, Z is a fluorine atom, a chlorine atom or a bromine atom; Y is a hydrogen atom, a halogen atom, an alkyl group or an aryl group, A is a heterocyclic radical containing at least one element selected from the group consisting of oxygen, nitrogen, sulphur and silenium, m is an interger of from 1 to 3, and n is an integer of 0 or 1,

(b) a coloring agent, and

(c) a light sensitive resist forming compound,

each of said 2-halomethyl-1,3,4-oxidiazole compound, said coloring agent and said light sensitive resist forming compound being present in an amount effective to provide a photosensitive resist forming composition capable of providing print-out images.

4,840,870

HEAT-TRANSFER IMAGE-RECEIVING ELEMENT

Masaru Iwagaki, Hino; Toyoaki Masukawa, Hinode; Tawara Komamura, Hachioji; Wataru Ishikawa, Hachioji, and Kimie Hoshino, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 930,019, Nov. 7, 1986, abandoned, which is a continuation of Ser. No. 679,912, Dec. 10, 1984, abandoned. This application Mar. 14, 1988, Ser. No. 170,063

Claims priority, application Japan, Dec. 19, 1983, 58-237965

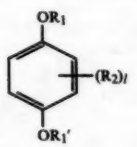
Int. Cl.[4] G03C *5/54*

U.S. Cl. 430—201 **11 Claims**

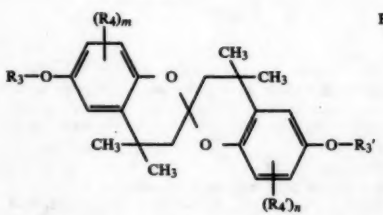
1. A heat transfer image forming method which comprises heating a heat-transfer image-receiving element in a superposed relation with a heat-transfer element containing a heat-transferable dye donator wherein dye is imagewise transferred by heat,

said heat-transfer image-receiving element comprising (a) at least one compound having the following general Formula (I), (II) or (III) and (b) at least one compound having the following general Formula (IV)

Formula (I)

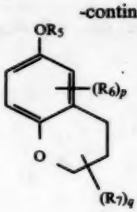


Formula (II)

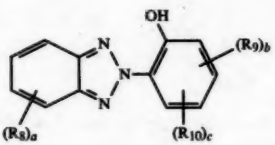


-continued

Formula (III)



Formula (IV)



wherein

R_1, R_1', R_3, R_3' and R_5 each is a hydrogen atom, alkyl, alkenyl, cycloalkyl, phenyl, naphthyl, heterocyclic, acyl, alkylsulfonyl, arylsulfonyl or aralkylsulfonyl group;

R_2, R_4, R_4', R_6 and R_7 each is a hydrogen atom, a halogen atom, or a monovalent organic group, l is an integer of from 1 to 4, q is an integer of from 1 to 6, and m, n and p each is an integer of from 1 to 3, provided if the l, m, n, p and q each is an integer of not less that 2, R_2, R_4, R_4', R_6 and R_7 are the same as or different from one another;

R_8, R_9 and R_{10} each is a hydrogen atom, a halogen atom, alkyl, alkenyl, cycloalkyl, phenyl, naphthyl, heterocyclic, acyl, amino, alkylsulfonyl, arylsulfonyl or aralkylsulfonyl group, and a, b and c each is an integer of from 1 to 4, R_8, R_9 and R_{10} are the same as or different from one another and c is an integer of from 1 to 4, R_8, R_9 and R_{10} are allowed to be either the same as or different from one another.

4,840,871

COLOR PHOTOGRAPHIC HEAT DEVELOPMENT PROCESS

Manfred Peters, Leverkusen; Hans Öhlschläger, Bergisch-Gladbach; Thomas Kaluschke, Leichlingen; Kaspar Wingender, Leverkusen; Günther Schenk, Cologne, and Immo Boie, Leichlingen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

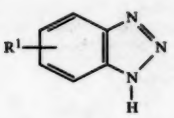
Filed Jun. 3, 1988, Ser. No. 201,840

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719880

Int. Cl.[4] G03C *5/54, 1/34*

U.S. Cl. 430—203 **4 Claims**

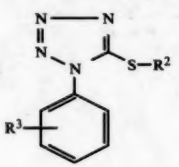
1. Process for the production of colour images by the photographic dye diffusion process in which a first light-sensitive sheet material is imagewise exposed, at least one of said first light-sensitive sheet material and a second light-insensitive sheet material is moistened with an aqueous liquid and the two sheet materials are together heated to 50°–100° C. with their coated surfaces in contact and then separated, said first sheet material containing, on a layer support, at least one light-sensitive silver halide emulsion layer and at least one non-diffusible colour providing compound which is capable of being decomposed imagewise in the process of development to release a diffusible dye and said second sheet material containing a salt of a strong organic base and a weak acid, wherein said first sheet material contains a combination of compounds corresponding to the following formulae I and II:



(I)

wherein

R^1 denotes hydrogen, alkyl with up to 6 carbon atoms, halogen, hydroxy, alkoxy or substituents which together form a condensed benzene ring, and



(II)

wherein

R^2 denotes a group which can be split off in the process of development of the material and

R^3 denotes hydrogen, halogen, alkyl with up to 4 carbon atoms, alkoxy, carboxy, carbalkoxy, carbonamido or sulphonamido.

4,840,872

PATTERN FORMING METHOD BY USE OF X-RAY EXPOSURE

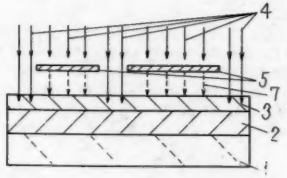
Masayuki Endo, Izumi; Masaru Sasago, and Kazufumi Ogawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1987, Ser. No. 108,698

Claims priority, application Japan, Oct. 16, 1986, 61-245705

Int. Cl.[4] G03C *1/495, 5/00*

U.S. Cl. 430—273 **9 Claims**



1. A pattern forming method comprising the steps of:

forming a resist layer on a semiconductor substrate;

forming a water-soluble organic film on said resist layer, said water-soluble organic film containing materials of high absorbing efficiency to soft X-rays or electrons,

selectively exposing said water-soluble organic film on said resist layer to X-rays,

removing said water-soluble organic film and

selectively developing said resist layer to form a resist pattern.

4,840,873

PRODUCTION OF OPTICAL RECORDING MEDIUM

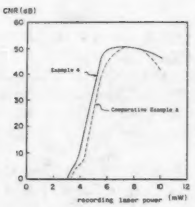
Hideki Kobayashi; Minoru Ikeda, both of Kurashiki; Koichi Saito, Okayama; Shiro Nagata, and Koichi Horino, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Kuraray Plasmon Data Systems Co., Ltd., Osaka, both of, Japan

Filed Jul. 10, 1987, Ser. No. 72,139

Claims priority, application Japan, Jul. 11, 1986, 61-164276

Int. Cl.[4] G03C *1/72, 1/94*

U.S. Cl. 430—273 **18 Claims**



1. A process for producing an optical recording medium, which comprises:

laminating a thin metal film ranging in thickness from 5 to 200 nm onto the minutely toughened surface of a plastic substrate; and

heat-treating said laminated structure at a temperature which is greater than 40° C. and which at the same time is a temperature within the range of a temperature 80° C. lower than the glass transition temperature of the plastic substrate to a temperature 60° C. higher than the glass transition temperature of the plastic substrate; said optical recording medium upon exposure to laser light of a specific wavelength region, being deformed by the formation of bubbles on the thin metal layer of the recording medium which provide for the recording of information.

4,840,874

METHOD OF FORMING RESIST PATTERN

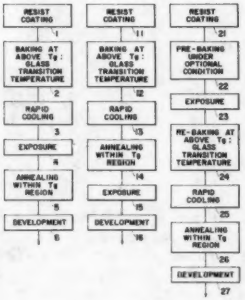
Fumiaki Shigemitsu; Kinya Usuda, and Tatsuo Nomaki, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1987, Ser. No. 99,895

Claims priority, application Japan, Sep. 25, 1986, 61-226901

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—296 **11 Claims**



1. A method of forming a resist pattern comprising the steps of: coating a resist on a substrate,

baking the coated resist at a temperature in its glass transition temperature region or higher,

rapidly cooling the baked resist to maintain the enthalpy of the resist in a high state so that the sensitivity of the resist is high,

exposing the resist to electromagnetic waves or corpuscular rays, and

developing the exposed resist, wherein said method further comprises the step of annealing said resist at a temperature within said glass transition temperature region after said cooling step and before said developing step for a period of time sufficient to relax the enthalpy of the resist and decrease its sensitivity to a desired value.

4,840,875

DESENSITIZING GUM FOR LITHOGRAPHIC PRINTING PLATE COMPRISING A POLYBASIC AND MONOESTER OF POLYSACCHARIDE

Kenji Kunichika; Hiroshi Matsumoto, both of Shizuoka, and Akira Shingu, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Oji-National Co., Ltd., Tokyo, both of, Japan

Filed Feb. 3, 1988, Ser. No. 151,989

Claims priority, application Japan, Feb. 4, 1987, 62-24355

Int. Cl.[4] G03C *5/24, 5/34*

U.S. Cl. 430—309 **19 Claims**

1. In a gumming-up process which comprises applying to a lithographic printing plate comprising an oleophilic image area and a hydrophilic non-image area, a desensitizing gum comprising a least one polybasic acid monoester of polysaccharide, said polybasic acid being selected from the group consisting of itaconic acid, maleic acid, phthalic acid, trimellitic acid, pyromellitic acid, endomethylene tetrahydrophthalic acid, chlorendic acid, methyl endomethylene tetrahydroxy phthalic acid, tetrahydroxy phthalic acid, diphenic acid, citraconic acid, glutaconic acid, glutaric acid, succinic acid, hexaisobutenyl succinic acid, nonyl succinic acid, n-octyl succinic acid, 2-ethyl-2-methylsuccinic acid, dimethylbenzyl succinic acid, octenyl succinic acid, hexenyl succinic acid, decenyl glutaric acid and dodecenyl succinic acid.

4,840,876

METHOD OF TREATING PHOTORESISTS

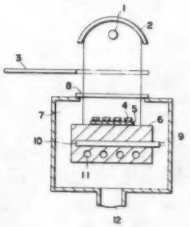
Tetsuji Arai, Yokohama, Japan, assignor to Ushio Denki, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 147,419

Claims priority, application Japan, Mar. 24, 1987, 62-67889

Int. Cl.[4] G03C *5/36*

U.S. Cl. 430—328 **12 Claims**



1. A method of treating a photoresist image developed on a semiconductor, comprising the steps of:

placing the semiconductor with the developed photoresist image thereon under a reduced pressure atmosphere;

exposing the photoresist image to ultraviolet radiation;

increasing the temperature of the photoresist image in proportion to an increasing flow temperature of the photoresist image while continually exposing said photoresist image to said ultraviolet radiation; and

controlling the increasing temperature of the photoresist image so that the photoresist image is maintained at a temperature greater than the increasing flow temperature of the photoresist image, during at least a portion of said continued exposure, and so as to prevent a substantial dimensional and shape change of the photoresist image.

4,840,877

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND METHOD FOR PROCESSING THE SAME

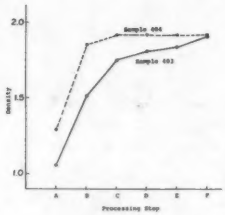
Akira Abe; Keiji Mihayashi; Hidetoshi Kobayashi, and Hirohiko Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1987, Ser. No. 94,638

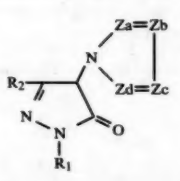
Claims priority, application Japan, Sep. 9, 1986, 61-212394; Sep. 30, 1986, 61-231496; Sep. 30, 1986, 61-231497

Int. Cl.[4] G03C *7/30, 7/38*

U.S. Cl. 430—350 **29 Claims**



13. A method for processing an imagewise exposed silver halide color photographic material comprising a color developing step and a drying step, said silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, at least one layer of said silver halide color photographic material containing the combination of a magenta dye forming coupler represented by general formula (I) and a compound which is not a coupler represented by general formula (II)



(I)

wherein R_1 represents an aromatic group, an aliphatic group or a heterocyclic group; R_2 represents a substituent; and Za, Zb, Zc and Zd, which may be the same or different, each represents an unsubstituted methine group, a substituted methine group or —N=,

$$(R'—COO^-)_nM^{n+} \quad \text{(II)}$$

wherein R' represents a substituent which imparts a diffusion-resistant proerty to the compound represented by the general formula (II) and wherein R' contains a total of from 8 to 40 carbon atoms, and represents a straight chain or branched chain alkyl group, an alkenyl group, an alkynyl group, a cyclic alkyl group, an aralkyl group, a cyclic alkenyl group, an aryl group, or a heterocyclic group; M^{n+} represents a hydrogen ion, a metal ion or an ammonium ion; and n represents an integer from 1 to 4, wherein the period of time from the beginning of said color developing step to the end of said drying step is at most about 15 minutes.

4,840,878

METHOD OF COLOR IMAGE FORMATION USING A HIGH CHLORIDE EMULSION AND A DEVELOPER FREE OF BENZYL ALCOHOL

Takeshi Hirose; Nobuo Furutachi; Kozo Aoki; Kiyoshi Nakazyo, and Genichi Furusawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

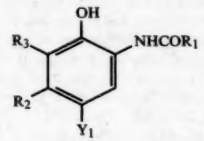
Continuation of Ser. No. 6,511, Jan. 23, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,932

Claims priority, application Japan, Jan. 23, 1986, 61-13416; Mar. 19, 1986, 61-61211; Jul. 25, 1986, 61-175233

Int. Cl.[4] G03C *5/24, 5/38, 7/30, 7/32*

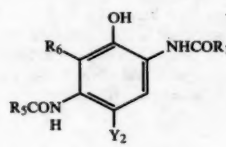
U.S. Cl. 430—380 22 Claims

1. A method for forming a color image, which comprises imagewise exposing a multi-layer silver halide color photographic material comprising a reflective support having provided thereon at least three silver halide emulsion layers different in color sensitivity, each of which separately contains at least one of couplers represented by formula (I)



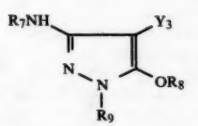
(I)

wherein R_1 represents an aliphatic group, an aromatic group, a heterocyclic group, an aromatic amino group, or a heterocyclic amino group; R_2 represents an aliphatic group; R_3 represents a hydrogen atom, a halogen atom, an aliphatic group, an aliphatic oxy group, or an acylamino group; or R_2 and R_3 are taken together to form a 5- or 7-membered ring; Y_1 represents a halogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; and R_1, R_2, or Y_1 may form a polymer including a dimer, and couplers represented by formula (II)



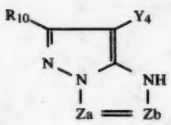
(II)

wherein R_4 and R_5 each represents an aliphatic group, an aromatic group, a heterocyclic group, an aromatic amino group, or a heterocyclic amino group; R_6 represents a hydrogen atom, a halogen atom, an aliphatic group, an aliphatic oxy group, or an acylamino group; or R_5 and R_6 are taken together to form a 5- or 7-membered ring; Y_2 represents a halogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; and R_4, R_5, R_6, or Y_2 may form a polymer including a dimer; at least one of couplers represented by formula (III)



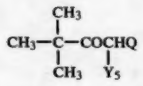
(III)

wherein R_7 and R_9 each represents a substituted or unsubstituted phenyl group; R_8 represents a hydrogen atom, an aliphatic or aromatic acyl group, or an aliphatic or aromatic sulfonyl group; Y_3 represents a hydrogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; and R_7, R_8, R_9, or Y_3 may form a polymer including a dimer, and couplers represented by formula (IV)



(IV)

wherein R_{10} represents a hydrogen atom or a substituent; Y_4 represents a halogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; Za and Zb each represents a methine group, a substituted methine group, or =N—; or R_{10}, Za, Zb, or Y_4 may form a polymer including a dimer; and at least one of couplers represented by formula (V)



(V)

wherein Y_5 represents a group capable of being split off upon coupling with an oxidation product of a developing agent; and Q represents a substituted or unsubstituted N-phenyl-carbamoyl group; or Y_5 or Q may form a polymer including a dimer, and processing the exposed material with a color developing solution [containing substantially no benzyl alcohol] for a period of not more than 2 minutes, wherein said silver halide emulsions each contains silver chlorobromide having a silver chloride content of 90 mol% or more and the color developing solution is free from benzyl alcohol.

4,840,879

DIRECT POSITIVE IMAGE-FORMING PROCESS

Atushi Kamitakahara, and Keiji Ogi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 846,845, Apr. 1, 1986, abandoned, which is a continuation of Ser. No. 693,794, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 457,490, Jan. 12, 1983, abandoned. This application Jan. 29, 1988, Ser. No. 153,519

Claims priority, application Japan, Jan. 12, 1982, 57-22507

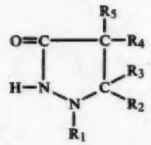
Int. Cl.[4] G03C *5/24, 7/16*

U.S. Cl. 430—406 7 Claims

1. A process for forming a direct positive color image comprising

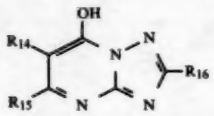
(a) imagewise exposing a direct positive photosensitive silver halide color photographic material to light to yield an imagewise exposed material, said photographic material having a support and at least one silver halide emulsion layer thereon, said emulsion layer containing a coupler and internal latent image type silver halide crystals whose surfaces have not been fogged prior to said imagewise exposure, and

(b) uniformly exposing to light the entire surface of said imagewise exposed photographic material before or during a development step and in the presence of a substance of Formula IV, a compound of Formula I and a color-developing agent consisting of aromatic primary amino compounds selected from the group consisting of N-methyl-aminophenol, 4-amino-3-methyl-N-ethyl-N-(β-methanesulfonamidoethyl) aniline,4-amino-3-methyl-N-ethyl-N-(β-hydroxyethyl) aniline,4-amino-3-methyl-N,N-diethyl-p-phenylenediamine, and 4-amino-3-methyl-N-ethyl-N-β-methoxyethyl-p-phenylenediamine; wherein the oxidized products thereof form a coupling reaction with said couplers to produce dyes,



I

wherein R_1 is selected from hydrogen, alkyls of 1 to 4 carbon atoms which are substituted or unsubstituted, and aryls which are substituted or unsubstituted; R_2–R_5 are individually selected from the same group as R_1 and hydroxyl;



IV

wherein R_{14} and R_{15} are individually selected from hydrogen, alkyls having 1 to 4 carbon atoms which may be substituted or unsubstituted, aryl groups which may be substituted or unsubstituted and non-metal atoms necessary for linking R_{14} and R_{15} in such a manner as to create 5 or 6 membered ring, and R_{16} is selected from hydrogen, alkyls having 1 to 4 carbon atoms which may be substituted or unsubstituted, and aryl groups which may be substituted, and wherein said exposed photographic material is processed in a prebath or a color developer containing 10 mg/l to 10 g/l of said formula compound.

4,840,880

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A YELLOW DIR COUPLER

Hans Öhlschläger; Günter Renner, both of Bergisch Gladbach; Friedrich-Wilhelm Kunitz; Heinrich Odenwälder, both of Leverkusen, and Dirk Hübner, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

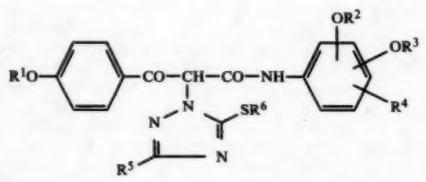
Filed Jul. 20, 1987, Ser. No. 75,574

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626219

Int. Cl.[4] G03C *7/36*

U.S. Cl. 430—505 **2 Claims**

1. Colour photographic recording material having at least one predominantly blue sensitive silver halide emulsion layer unit associated with at least one yellow coupler, a predominantly green sensitive silver halide emulsion layer unit associated with at least one magenta coupler and a predominantly red sensitive silver halide emulsion layer unit associated with at least one cyan coupler, each of said silver halide emulsion layer units comprising two or more silver halide partial layers, characterised in that at least one partial layer of the predominantly green sensitive silver halide emulsion layer unit or of the predominantly red sensitive silver halide emulsion layer unit contains a compound corresponding to the following formula:



wherein

R^1 denotes a straight chained or branched alkyl group with up to 18 carbon atoms;

R^2, R^3 denote identical or different alkyl groups with up to 18 carbon atoms;

R^4 denotes Cl;

R^5 denotes H or alkyl with up to 9 carbon atoms;

R^6 denotes a saturated or unsaturated aliphatic group with up to 10 carbon atoms

and the total number of carbon atoms in R^5 and R^6 is not less than 5 and not greater than 10.

4,840,881

PROCESS FOR THE PRODUCTION OF LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yoshikazu Watanabe, Hino, and Motoaki Tanaka, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 894,475, Aug. 4, 1986, abandoned, which is a continuation of Ser. No. 682,481, Dec. 17, 1984, abandoned, which is a continuation of Ser. No. 548,421, Nov. 3, 1983, abandoned, which is a continuation of Ser. No. 471,602, Mar. 4, 1983, abandoned, which is a continuation of Ser. No. 297,119, Aug. 28, 1981, abandoned, which is a continuation of Ser. No. 875,875, Feb. 7, 1978, abandoned. This application Jul. 21, 1988, Ser. No. 223,713

Claims priority, application Japan, Feb. 10, 1977, 13601

Int. Cl.[4] G03C *7/32*

U.S. Cl. 430—512 **27 Claims**

1. A process for the preparation of a light-sensitive silver halide photographic material comprising a support, a silver halide emulsion layer, and a non-light-sensitive hydrophilic colloid layer consisting essentially of two layer elements, said process comprising incorporating an oil particle-forming substance into at least one of said elements, the density of the oil particles of the outermost layer element being not more than 0.3 cc/cc, the oil particle density of the second of said layer elements being greater than the oil particle density of said outermost layer element, the difference in oil particle density between the outermost layer element and the second of said layer elements being sufficient to reduce at least one of turbidity, adhesion, or static, and wherein said non-light-sensitive hydrophilic colloid layer and said silver halide emulsion are applied to said support at substantially the same time.

4,840,882

HEAT DEVELOPABLE COLOR LIGHT-SENSITIVE MATERIAL

Masaru Iwagaki; Takashi Sasaki; Tawara Kumamura; Fumio Ishii, and Kunihiro Koshizuka, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 898,849, Aug. 19, 1986, abandoned, which is a continuation of Ser. No. 674,569, Nov. 26, 1984, abandoned. This application Aug. 31, 1988, Ser. No. 240,361

Claims priority, application Japan, Dec. 2, 1983, 58-226759

Int. Cl.[4] G03C *5/54, 1/46*

U.S. Cl. 430—505 **18 Claims**

1. In a heat-developable color light-sensitive material comprising a support having thereon at least two light-sensitive layers each comprising a light-sensitive silver halide, organic silver salt, dye-donating material capable of releasing or forming a diffusible dye by heat development, reducing agent, and hydrophilic binder, said at least two light-sensitive layers differing from each other in the color sensitivity of said light-sensitive silver halide and in the hue of said diffusible dye,

said heat-developable color light-sensitive material, wherein at least one of said light-sensitive layer(s) containing said dye-donating materials is homogeneously hardened with a hardening agent for said hydrophilic binder.

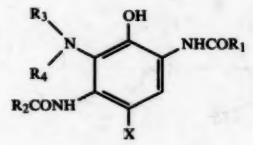
4,840,883

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING NOVEL CYAN COUPLER

Toyoaki Masukawa; Hidetaka Ninomiya, and Hiroyuki Iizuka, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jun. 14, 1988, Ser. No. 206,580
Claims priority, application Japan, Jun. 26, 1987, 62-160324
Int. Cl.[4] G03C 7/34
U.S. Cl. 430—553 22 Claims

1. A light-sensitive silver halide color photographic material having at least one silver halide emulsion layer on a support, characterized in that at least one layer of said silver halide emulsion layer contains at least one cyan coupler represented by the formula (I) shown below:



(I)

wherein R_1 and R_2 each represent an alkyl group, an aryl group, a heterocyclic group, a dialkylamino group, an anilino group, an alkoxy group or an aryloxy group; R_3 represents a hydrogen atom or an alkyl group; R_4 represents a hydrogen atom, an alkyl group, an aryl group, a R_5CO— group or a R_5SO_2— group; provided that R_3 and R_4 cannot be hydrogen atoms at the same time; R_5 represents a hydrogen atom, an alkyl group, an aryl group, a dialkylamino group, an anilino group, an alkoxy group or an aryloxy group; and X represents a hydrogen atom or an eliminatable group through the reaction with the oxidized product of a color developing agent.

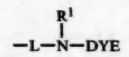
4,840,884

PHOTOGRAPHIC ELEMENT AND PROCESS COMPRISING A DYE RELEASING GROUP

Jared B. Mooberry, and Stephen P. Singer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1987, Ser. No. 109,371
Int. Cl.[4] G03C 7/18, 7/32, 7/36
U.S. Cl. 430—557 10 Claims

1. A photographic element comprising a support bearing a silver halide photographic emulsion and a coupler having a coupling-off group bonded to the coupler at the coupling position wherein the coupling-off group is represented by the formula:

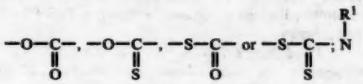


wherein

L is a linking group cleavable from

after coupling-off and contains —B— bonded to

wherein —B— is



is a substituted nitrogen atom bonded to DYE that together with the substituted nitrogen atom is a releasable dye comprising an electrically neutral chromophore; wherein the linking group enables a spectral shift in absorption of DYE.

4,840,885

COLOR PHOTOGRAPHIC RECORDING MATERIAL FOR THE DYE DIFFUSION TRANSFER PROCESS

Manfred Peters, Leverkusen; Günter Helling, Odenthal, and Helmut Reiff, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,618
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708307
Int. Cl.[4] G03C 5/54, 7/26
U.S. Cl. 430—559 7 Claims

1. A photographic recording material having at least one supported layer of binder containing a light sensitive silver halide and at least one non-diffusible color providing compound capable of releasing a diffusible dye upon development, said color providing compound being contained in the binder layer in the form of a dispersion of particles of an ionically modified polymer which is charged or loaded with the color providing compound wherein the ionically modified polymer is an ionomeric polyaddition or polycondensation product containing from 4 to 180 milliequivalents of ionic groups per 100 g and is selected from the group consisting of polyurethanes, polyesters, polyamides, polyureas, polycarbonates, polyacetals, polyethers and ionomeric products belonging to two or more types thereof.

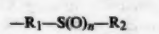
4,840,886

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING A 1H-PYRAZOLE (3,2-C)-S-TRIAZOLE DERIVED MAGENTA COUPLER

Toshifumi Iijima; Kenji Kumashiro; Hiroshi Kashiwagi; Koichi Hatta; Yuji Hotta; Hiroko Ohya; Noritaka Nakayama; Satoshi Kawakatsu; Katsunori Katoh, and Kaoru Shinozaki, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Continuation of Ser. No. 086,188, Aug. 14, 1987, abandoned, which is a continuation of Ser. No. 775,685, Sep. 13, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 161,321
Claims priority, application Japan, Sep. 14, 1984, 59-193609; Sep. 17, 1984, 59-195234; Nov. 15, 1984, 59-243012; Nov. 15, 1984, 59-243015; Apr. 3, 1985, 60-70198
Int. Cl.[4] G03C 1/08, 7/26, 7/32, 1/46
U.S. Cl. 430—558 11 Claims

1. A silver halide color photographic material having at least one silver halide emulsion layer on a support, said silver halide emulsion layer containing at least one of the 1H-pyrazolo[3,2-c]-S-triazole derived magenta couplers that have a substituent of the following formula at 3-position:



wherein

R_1 is an alkylene group;

R_2 is an alkyl, cycloalkyl or aryl group; and

n is 1 or 2.

4,840,887

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Koki Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

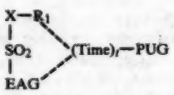
Filed Apr. 29, 1988, Ser. No. 188,779

Claims priority, application Japan, Apr. 30, 1987, 62-106885

Int. Cl.[4] G03C 1/02, 1/46, 1/08, 1/06

U.S. Cl. 430—564 10 Claims

1. A silver halide photographic material comprising a support having formed thereon at least one silver halide emulsion layer, wherein the silver halide photographic material contains, in the silver halide emulsion layer, other hydrophilic colloid layer(s), or both, a compound represented by formula (I)



(I)

wherein EAG represents an electron accepting group, $—SO_2—$ represents a sulfonylene group; X represents an oxygen atom (—O—), a sulfur atom (—S—) or an atomic group ($—N(R_2)—$) containing a nitrogen atom; the single bond between $—SO_2$ and X being cleaved after EAG receives an electron, wherein R_1 and R_2 each represents a simple bond or a group other than a hydrogen atom; said R_1, R_2, EAG may be combined with each other to form a ring; (Time) represents a group capable of releasing a photographically useful group (PUG) upon the cleavage of the SO_2—X bond; t represents 0 or 1; when said t is 0, (Time) represents a simple bond and X may be a part of PUG; the solid line represents a bond; the dotted lines show that at least one of them is bonded.

4,840,888

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Mikio Kawasaki; Hiroaki Shiozawa; Kakujulo Fukuouji, and Kouji Ono, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 5,489, Jan. 20, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 266,211

Claims priority, application Japan, Jan. 22, 1986, 61-11427; Mar. 18, 1986, 61-61190

Int. Cl.[4] G03C 5/26, 1/10

U.S. Cl. 430—567 12 Claims

1. In a light-sensitive silver halide photographic material having at least one silver halide emulsion layer on a support, the improvement wherein said light-sensitive photographic material contains light-sensitive silver halide grains, metal salt grains having internal fog and a polyhydric alcohol having at least two hydroxyl groups having a melting point of 40° C. or higher.

4,840,889

HIGH WHITENESS SILVER HALIDE PHOTOGRAPHIC PAPER FOR DIRECT POSITIVES

Yutaka Uesawa, and Isamu Morimoto, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 93,821

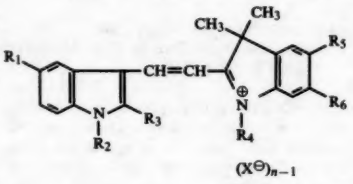
Claims priority, application Japan, Sep. 11, 1986, 61-214658; May 1, 1987, 62-108138

Int. Cl.[4] G03C 1/36, 1/92

U.S. Cl. 430—597 12 Claims

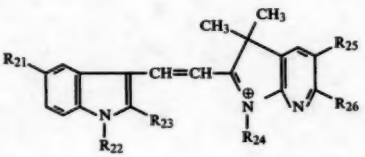
1. A silver halide photographic paper for direct positives, comprising a support and a silver halide emulsion layer for direct positives, provided on the support and containing silver halide grains having been fogged in the presence of a reduction fogging agent and a water-soluble gold compound, wherein a photographic layer on the side on which said silver halide emulsion layer for direct positives is provided contains an emulsion dispersion or latex dispersion of an oil-soluble brightening agent, and simultaneously contains at least one of organic desensitizers represented by formula (I), (II), (III), (IV) or (V):

formula (I)



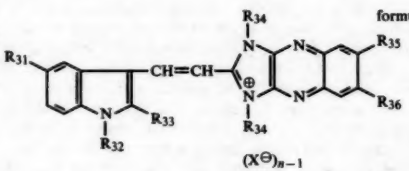
$(X^{\ominus})_{n-1}$

formula (II)



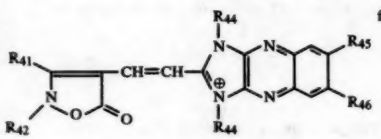
$(X^{\ominus})_{n-1}$

formula (III)



$(X^{\ominus})_{n-1}$

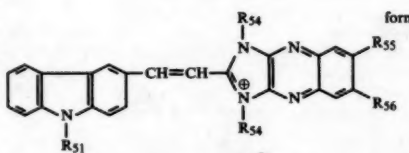
formula (IV)



$(X^{\ominus})_{n-1}$

or

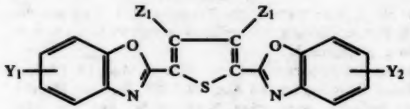
formula (V)



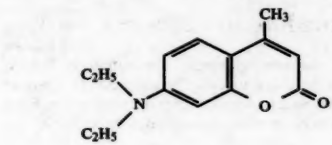
$(X^{\ominus})_{n-1}$

wherein R^1, R^{21} and R^{31} each represent a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, aryloxy group or a nitro group, R^2, R^3, R^4, R^{22}, R^{23}, R^{24}, R^{32}, R^{33}, R^{34}, R^{44} and R^{54} each represent an alkyl group, an alkenyl group, an aryl group or an aralkyl group, which may be unsubstituted or substituted, R^5, R^6, R^{25}, R^{26}, R^{35}, R^{36},R^{45}, R^{46}, R^{55} and R^{56} each represent a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a thienyl group, an alkoxy group, a hydoxy group, a cyano group, an alkylsulfonyl group, an alkoxycarbonyl group, a phenylsulfonyl group, a trifluoromethyl group, a trifluoromethylsulfonyl group or a nitro group, R^{41} represents an aryl group, R^{42} represents an alkyl group, R^{51} represents an alkyl group which may be unsubstituted or substituted, $X^{\ominus}$ represents an anion and n represents 1 or 2 with proviso that in case where the compound forms an

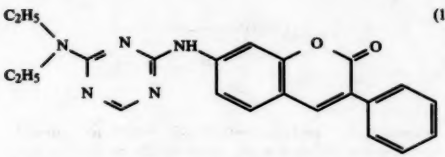
internal salt, n is 1 and said oil-soluble brightening agent being selected from the group consisting of:



(4)



and



(10)

wherein Y^1 and Y^2 each represent an alkyl group, Z^1 a hydrogen atom or an alkyl group.

4,840,890

HARDENED PROTEINIC BINDER LAYER

Hans Öhlschläger, Bergisch Gladbach; Karl-Wilhelm Schranz, Odenthal-Hahnenberg, and Johannes Sobel, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 875,607, Jun. 18, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 147,032

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523360

Int. Cl.[4] G03C *1/30*

U.S. Cl. 430—622 **4 Claims**

3. Light-sensitive photographic recording material comprising at least one gelatin-containing binder layer which has been hardened with a heteroaromatic vinylsulphone compound corresponding to the following formula:

$$Z(-SO_2-CH=CH_2)_2$$

wherein Z denotes a triazole, thiadiazole, pyridine or triazine which may be substituted further.

4,840,891

ENCAPSULATION OF SPERM FOR ARTIFICIAL INSEMINATION

Jonathan van Blerkom, Denver, Colo., assignor to Genetic Engineering, Inc., New City, N.Y.

Filed Sep. 3, 1986, Ser. No. 903,120

Int. Cl.[4] A01N *1/02;* C12N *11/04*

U.S. Cl. 435—2 **15 Claims**

1. A method of encapsulating viable mammalian sperm for storage or transfer, and subsequent insemination of a female mammal, which comprises encapsulating the sperm with a nontoxic hydrophilic polymer, said polymer being essentially freely flowable at the temperature of the uterus of such mammal, but not freely flowable at the temperature of storage or transfer, the polymer at the latter temperature being permeable to molecules of a predetermined size but not to the sperm whereby the sperm may receive nutrients and excrete waste products through the microcapsule without escaping; the sperm escaping from the microcapsule at said uterine temperature when the polymer becomes freely flowable.

4,840,892

POLYNUCLEOTIDE HYBRIDIZATION PROBES

Craig W. Adams, King of Prussia, Pa.; Jeffry J. Leary, Brea, Calif., and Martin Rosenberg, Malvern, Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 610,363, May 15, 1984, abandoned. This application Apr. 15, 1985, Ser. No. 723,388

Int. Cl.[4] C12Q *1/70, 1/68;* C12P *19/34*

U.S. Cl. 435—5 **17 Claims**

1. A method for preparing a polynucleotide hybridization probe which comprises selectively protecting a probe region within a single stranded polynucleotide having a probe region and a non-probe region both 5' and 3' to the probe region by hybridizing the probe region to a complementary sequence and then chemically modifying the non-probe region of the remaining single-stranded portion of the polynucleotide.

4,840,893

ELECTROCHEMICAL ASSAY FOR NUCLEIC ACIDS AND NUCLEIC ACID PROBES

Hugh A. O. Hill, and Susan I. Libor, both of Oxford, England, assignors to Medisense, Inc., Cambridge, Mass.

PCT No. PCT/GB84/00432, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/02627, PCT Pub. Date Jun. 20, 1985

PCT Filed Dec. 14, 1984, Ser. No. 769,629

Claims priority, application United Kingdom, Dec. 16, 1983, 8333650; Dec. 16, 1983, 8333651; Jan. 19, 1984, 8401399

Int. Cl.[4] C12P *1/68;* G01N *33/53, 33/566;* C07H *19/06*

U.S. Cl. 435—6 **47 Claims**

1. An assay for determining a target nucleic acid sequence which comprises the steps of:

(a) providing a probe material comprising,

(i) a sequence of nucleic acids complementary to a given target sequence and,

(ii) a first ligand chemically linked thereto and capable of a specific binding reaction with an antiligand;

(b) contacting the said probe material with an assay system comprising,

(i) a mediator, enzyme, substrate system capable of transferring charge to an electrode surface when the enzyme is catalytically active, and

(ii) a second ligand chemically linked to one of said mediator, enzyme or substrate, wherein the second ligand is capable of competing with the first ligand for binding with the antiligand, and (iii) said antiligand;

whereby said first ligand competes with said second ligand in a specific binding reaction with the antiligand, the extent of binding of said second ligand to said antiligand being reflected in the charge which said system transfers to said electrode surface;

(c) contacting the above system with a solution suspected of containing the said target sequence whereby the binding of any of the said target sequence present in the solution to the probe affects the availability of the first ligand to compete with said second ligand to bind said antiligand and therefore alters the rate of charge transfer to the electrode and

(d) measuring said charge transfer and relating said measurement to the determination of said target nucleic acid sequence.

4,840,894

METHOD FOR DETECTING A MARKER FOR ESSENTIAL HYPERTENSION AND DIAGNOSTIC USE THEREOF

David Schachter; Szloma Kowarski, both of Bronx; Lisa A. Cowen, New York, all of N.Y., and Richard E. Abbott, Englewood, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Mar. 4, 1986, Ser. No. 835,898

Int. Cl.[4] G01N *33/53, 33/543, 33/555, 33/577*

U.S. Cl. 435—7 34 Claims

1. A diagnostic method for identifying an individual predisposed to essential hypertension which comprises determining the amount of an integral membrane, calcium-binding protein present in a sample of a tissue from the individual, the integral-membrane, calcium-binding protein having a molecular weight of about 200,000 daltons in non-denaturing detergents and of about 20,500 daltons in sodium dodecyl sulfate polyacrylamide gels, a blocked amino terminus, an isoelectric point of about 4.5 and an affinity constant for the complexation of calcium of about 2.4 micromolar, and comparing the amount so determined with the amount of such protein present in a sample of the same tissue from a normal individual, a reduced amount being indicative of predisposition to essential hypertension.

4,840,895

MONOCLONAL ANTIBODIES REACTIVE WITH IMMUNE COMPLEXES

Colin H. Self, London, England, assignor to Cambridge Patent Development Limited, United Kingdom

PCT No. PCT/GB85/00120, § 371 Date Nov. 18, 1985, § 102(e) Date Nov. 18, 1985, PCT Pub. No. WO85/04422, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 29, 1985, Ser. No. 803,137

Claims priority, application United Kingdom, Mar. 30, 1984, 8408193

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] G01N *33/53*

U.S. Cl. 435—7 78 Claims

1. A secondary monoclonal antibody against a complex of a molecule of molecular weight less than 5000 and a binding protein against said molecule which secondary monoclonal antibody is not an antibody against molecule or against its binding protein.

4,840,896

HETEROPOLYMERIC PROTEIN

Vemuri B. Reddy, Framingham; Nancy Hsiung, Wellesley; Anton K. Beck, Chestnut Hill, and Edward G. Bernstine, Boston, all of Mass., assignors to Integrated Genetics, Inc., Framingham, Mass.

Filed Nov. 2, 1983, Ser. No. 548,228

Int. Cl.[4] C12P *19/00, 5/00, 15/00*

U.S. Cl. 435—68 18 Claims

1. A mammalian cell comprising a first expression vector, said cell being capable of producing a biologically active heterodimeric human fertility hormone comprised of an alpha subunit and a beta subunit, each said subunit being encoded in nature by a distinct mRNA, said hormone being selected from the group consisting of hCG, and LH, the alpha subunit of said hormone being encoded by said first expression vector and the beta subunit being encoded by said first expression vector or a second expression vector.

4,840,897

MODIFIED HUMAN INSULIN AND ITS USE AS STARTING MATERIAL FOR THE PREPARATION OF HUMAN INSULIN

Gijsbert W. K. Van Dedem, and Francois E. A. Van Houdenhoven, both of Heesch, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

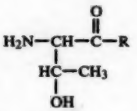
Continuation-in-part of Ser. No. 485,592, Apr. 18, 1983, abandoned. This application Aug. 20, 1985, Ser. No. 767,481

Claims priority, application Netherlands, Apr. 21, 1982, 8201650

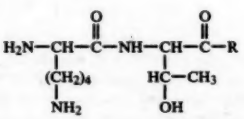
Int. Cl.[4] C12P *21/06, 21/02, 21/04;* C07K *7/40*

U.S. Cl. 435—69 6 Claims

3. Method for the semi-synthetic preparation of human insulin comprising (a) enzymatically bonding des-B30-insulin to a peptide comprising 2 to 4 amino acids or the amide or ester thereof, wherein the N-terminal amino acid is threonine, of the formula:



or enzymatically bonding desB29, B30-insulin to a peptide comprising 3 to 5 amino acids or the amide or ester thereof, wherein the N-terminal dipeptide is lysine-threonine, of the formula:



wherein R is selected from the group consisting of a hydrophobic amino acid, a charged amino acid, a dipeptide or a tripeptide wherein at least one of the amino acids is a hydrophobic or charged amino acid, an amide of said amino acid, dipeptide or tripeptide and an ester of said amino acid, dipeptide or tripeptide, to form the modified human insulin of claim 1, (b) isolating the modified human insulin (c) enzymatically removing R from the isolated modified human insulin and (d) thereafter isolating the resulting human insulin, wherein selection of enzymes in step (a) and step (c) is dictated by the peptide and by R, respectively, and wherein isolation of the modified human insulin in step (b) is conducted under hydrophobic conditions if the amino acids in the peptide are hydrophobic and under polar or ionizing conditions if the amino acids in the peptide are charged.

4,840,898

HIGH TEMPERATURE METHOD FOR THE PRODUCTION OF RIBAVIRIN

Jefferson C. Lievense, Rochester, N.Y.; Joanna D. Sawyer, Littleton, Colo., and Anthony J. Terpolilli, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,762

Int. Cl.[4] C12P *19/38, 19/28;* C12R *1/13*

U.S. Cl. 435—87 5 Claims

1. In a method for the production of a 1,2,4-triazole nucleoside comprising the step of reacting a ribose donor with a triazole compound in the presence of an enzyme preparation derived from *Brevibacterium acetylicum,* the improvement wherein the ribose donor is guanosine or a guanosine derivative and the temperature during at least a part of the reaction is at or above 65° C. so that the precent conversion of starting materials to the 1,2,4-triazole nucleoside is greater than about 58 percent.

4,840,899

METHOD FOR THE PRODUCTION OF RIBAVIRIN USING HIGH ROBOSE DONOR CONCENTRATIONS

James M. Pochodylo, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,767
Int. Cl.[4] C12P *19/35, 19/28;* C12R *1/13*
U.S. Cl. 435—87 6 Claims

1. In a method for the production of a 1,2,4-triazole nucleoside comprising the step of reacting a ribose donor with a triazole compound in the presence of an enzyme preparation derived from Brevibacterium acetylicum, the improvement wherein the ribose donor is guanosine or a guanosine derivative; the concentration of the donor is above about 100 mM; said triazole compound is present in the amount of at least 100 mM; and the enzyme preparation is added.

4,840,900

CONTINUOUS PROCESS FOR THE PREPARATION OF IMMOBILIZED GLUCOAMYLASE

John M. Wasileski, Brookfield, Wis., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 13, 1987, Ser. No. 37,652
Int. Cl.[4] C12P *19/20;* C12N *11/02, 11/08, 9/34*
U.S. Cl. 435—96 16 Claims

1. A process for preparing a biocatalyst comprising glucoamylase enzyme immobilized on porous, particulate, macroreticular anionic exchange resin,

said glucoamylase being a water soluble fungal derived enzyme, and

said resin being in free base form and having a particle size of about 0.50±0.20 mm and said particles having pore sizes therein of about 900 to 2000 Angstrom units,

which comprises depositing said enzyme on said resin in a continuous deposition mode of operation, said depositing being carried out in a period of about 1 to 2 hours at a temperature not to exceed 50° C. with 10±5 volumes of enzyme solution per volume of said resin, said enzyme solution having a concentration of about 100 to 200 IU of said enzyme per ml of said solution and said solution being buffered with acetate buffer at a pH of 4.0±0.3, and said depositing thereby providing a loading of about 1000 to 1500 IU of said enzyme per gram of said resin in dry form, and stabilizing the resultant deposited enzyme by treating the deposited enzyme with an aqueous solution of carbohydrate selected from the group consisting of starch, glucose and oligosaccharides in such an amount and for such a period of time as to render said enzyme substantially non-leachable from said resin when the resin is an expanded or non-expanded ionic form.

4,840,901

RESTRICTION ENDONUCLEASE DRA II

Rüdiger Grosskopf, Haar, and Christoph Kessler, Munich, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 738,036, May 24, 1985, abandoned. This application May 20, 1988, Ser. No. 198,621
Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420298
Int. Cl.[4] C12P *19/34;* C12N *9/22*
U.S. Cl. 435—91 5 Claims

1. Restriction endonuclease which recognizes palindromic sequence

5'Pu G G N C C Py 3'
3'Py C C N G G Pu 5'

and cleaves said palindromic sequence at a point between the second and third base from the 5' end.

4,840,902

CONTINUOUS PROCESS FOR ETHANOL PRODUCTION BY BACTERIAL FERMENTATION USING PH CONTROL

Hugh G. Lawford, Mississauga, Canada, assignor to George Weston Limited, Toronto, Canada

Continuation-in-part of Ser. No. 772,492, Apr. 12, 1985. This application May 4, 1987, Ser. No. 45,409
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] C12P *7/06;* C12N *1/38, 1/00*
U.S. Cl. 435—161 11 Claims

1. A continuous process for the production of ethanol, which comprises

feeding an aqueous substrate solution substantially continuously to a reactor containing a fermentation medium and a submerged culture of an organism of the genus Zymomonas;

cultivating said organism to produce ethanol under substantially steady state anaerobic conditions in an aqueous nutrient medium containing assimilable carbon, nitrogen and phosphorus;

controlling pH in the fermentation medium between a pH of about 3.8 and a pH less than 4.5 so that ethanol production is substantially uncoupled from cell growth and wherein the biomass expresses values for both the specific rate of substrate uptake (q_s) and the specific rate of ethanol formation (q_p) which are greater than the values would be for a similar process conducted at a higher pH; and

removing an effluent containing ethanol from the reactor.

4,840,903

PROCESS FOR PRODUCING ETHANOL FROM PLANT BIOMASS USING THE FUNGUS PAECILOMYCES SP.

Jung Fu Wu, Lakewood, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1985, Ser. No. 763,585
Int. Cl.[4] C12P *7/10;* C12R *1/79*
U.S. Cl. 435—165 27 Claims

1. A process for producing ethanol from plant biomass comprising:

forming a substrate from said biomass, said substrate including hydrolysates of cellulose and hemicellulose;

selecting and isolating a species of the fungus *Paecilomyces sp.* NF1 which species has the ability to ferment both cellobiose and xylose to ethanol;

inoculating said substrate with said selected fungus;

fermenting said inoculated substrate under conditions favorable for cell viability and conversion of hydrolysates to ethanol; and

recovering the ethanol from said substrate.

4,840,904

RECOVERY AND REUSE OF CELLULASE CATALYST IN AN EXZYMATIC CELLULOSE HYDROLYSIS PROCESS

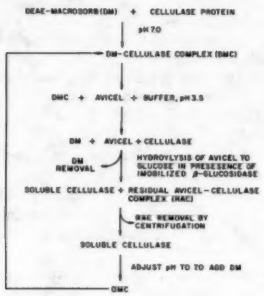
Jonathan Woodward, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 18, 1987, Ser. No. 98,242
Int. Cl.[4] C12P *7/10, 19/02*
U.S. Cl. 435—165 4 Claims

1. A process for recovering cellulase subsequent to cellulose hydrolysis comprising:

at a basic pH contacting a solution of reactant products from the hydrolysis of cellulose, including cellulase, with Kie-

selguhi granules adsorbent, thereby resulting in the adsorption of said cellulase on said adsorbent; contacting


DEAE-MACROSORB (DM) + CELLULASE PROTEIN
pH 7.0
DM-CELLULASE COMPLEX (DMC)
DMC + AVICEL + BUFFER, pH 3.5
DM + AVICEL + CELLULASE
DM REMOVAL
HYDROLYSIS OF AVICEL TO GLUCOSE IN PRESESENCE OF IMMOBILIZED β-GLUCOSIDASE
SOLUBLE CELLULASE + RESIDUAL AVICEL-CELLULASE COMPLEX (RAC)
RAC REMOVAL BY CENTRIFUGATION
SOLUBLE CELLULASE
ADJUST pH TO TO ADD DM
DMC

said cellulase and a solution having an acidic pH to separate said cellulase from said adsorbent.

4,840,905

PROCESS FOR CULTURING BIOLOGICAL MATERIAL

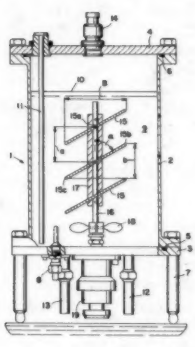
Michael J. Kearns, Salisbury, England, and Michael J. Comer, Bernried, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 106,115

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634203

Int. Cl.[4] C12N *5/02*

U.S. Cl. 435—240.25 **13 Claims**



1. A process for culturing biological material capable of multiplication, which comprises the steps of:

homogeneously suspending the biological material in a culture medium;

placing said culture medium in a bioreactor comprising a vessel having a top wall and a bottom wall, means for controlling environmental conditions in the culture medium, and stirring means for the homogeneous distribution of the biological material in the culture medium, the stirring means having a rotation axle defining an axial direction and attached to a rotary drive means for driving the stirring means, said stirring means extending into and rotating in the interior of the vessel and comprising a plurality of stirrer blades in the form of plates affixed at adjacent points along the rotation axle with an angle of inclination toward said rotation axle, each stirrer blade having at its edge two extreme points displaced in the axial direction from the point at which the plate is fixed to the rotation axle, these extreme points having a predetermined distance in axial direction from each other, and wherein said points at which said stirrer blades are affixed to said rotation axle are separated from each other by a distance in the range of at least about half as great as said predetermined distance between said extreme points; and

causing said stirrer blades to rotate, thereby keeping said biological material in homogeneous suspension while the biological material is multiplying.

4,840,906

PLANT GENERATION METHOD

Clifford P. Hunter, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed May 14, 1987, Ser. No. 49,360

Claims priority, application United Kingdom, May 15, 1986, 8611818

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240.49 **8 Claims**

1. A method of generating barley plants comprising culturing barley microspores on a sugar-containing medium and harvesting green plantlets from the medium characterized in that the sugar in the sugar-containing medium is selected from the group consisting of (a) glucose having a concentration in the medium of not greater than 0.03 mol/1; (b) oligosaccharides, containing 2 to 10 monosaccharide residues, at least two of which are glucose residues, having a concentration in the medium of 0.05 to 0.35 mol/1; or (c) polysaccharides, containing more than 10 monosaccharide residues, at least two of which are glucose residues, having a concentration in the medium of 2 to 12 percentage w/v (grams per 100 ml).

4,840,907

PROCESS FOR PRODUCING OPTICALLY ACTIVE DICHLOROPROPANOL USING MICROORGANISM

Naoya Kasai, Kishiwada; Hisaharu Shima, Amagasaki, and Kazuya Tsujimura, Sakai, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,711

Claims priority, application Japan, Jul. 3, 1985, 60-147065

Int. Cl.[4] C12R *1/38;* **C12P** *41/00, 7/04*

U.S. Cl. 435—253.3 **7 Claims**

1. A process for producing optically active dichloropropanol, which comprises cultivating the R-(+)-2,3-dichloro-1-propanol-assimilating strain Pseudomonas OS-K-29 as deposited with the Fermentation Research Institute, Agency of Industrial Science and Technology, Japan, under Deposit No. FERM BP-994 in a culture medium containing racemate 2,3-dichloro-1-propanol and recovering optical isomer S-(−)-2,3-dichloro-1-propanol from the culture broth.

4,840,908

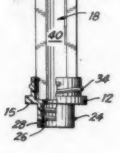
CULTURE BOTTLE ASSEMBLY

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 29, 1988, Ser. No. 217,481

Int. Cl.[4] C12M *1/24*

U.S. Cl. 435—296 **10 Claims**



1. A device for culturing microorganisms wherein the sam-

ple of interest is to be exposed separately to both a solid and a liquid culture medium; characterized by

(a) a generally flat base;
(b) said base having an upper surface and a lower surface;
(c) an extension extending integrally from said bottom surface of said base;
(d) a bore positioned substantially centrally in said base;
(e) said bore extending from said top surface through said extension;
(f) internal threads in said bore in the area thereof extending through said extension;
(g) an upright solid medium support extending upwardly from said upper surface of said base;
(h) a transparent elongated cap for covering said upright solid medium;
(i) said cap having an open end and a closed end;
(j) said cap, at the open end thereof, and said base having cooperating connecting means for holding said cap on said base; and
(k) whereby upon connecting of said internal threads to a liquid culture body, said bore provides connection of the liquid contents of a liquid culture bottle to said solid medium on said upright solid medium support.

10. An assembly for culturing microorganisms wherein the solid medium is contained separately to the liquid medium after exposure, characterized by

(a) a liquid culture medium bottle;
(b) said bottle having a closed end and an open end;
(c) a neck on said bottle adjacent the open end;
(d) external threads on said neck; and
(e) a device for connection to said external threads, said device comprising
(1) a generally flat base;
(2) said base having an upper surface and a lower surface;
(3) an extension extending integrally from said bottom surface of said base;
(4) a bore positioned substantially centrally in said base;
(5) said bore extending from said top surface through said extension;
(6) internal threads in said bore in the area thereof extending through said extension for cooperating with said external threads on said neck allowing momentary contact of said solid medium with said liquid medium with subsequent segregation;
(7) an upright solid medium support extending upwardly from said upper surface of said base;
(8) a transparent elongated cap for covering said upright solid medium during culturing;
(9) said cap having an open end and a closed end; and
(10) said cap, at the open end thereof, and said base having cooperating connecting means for holding said cap on said base and for exposing said solid medium to examination.

4,840,909

METHOD OF PREPARING A SULFONAMIDE-FOOD COLOR ADDITIVE FOR DETECTION OF SULFONAMIDES IN ANIMAL FEEDS AND PHARMACEUTICALS PREPARATIONS

Irving S. Rossoff, 515 Springfield Rd., P.O. Box 333, Taylorville, Ill. 62568

Continuation of Ser. No. 846,360, Mar. 31, 1986. This application Aug. 26, 1987, Ser. No. 89,511

Int. Cl.[4] G01N *33/02*

U.S. Cl. 436—20 **5 Claims**

1. A method for preparing a sulfonamide-food color additive product for incorporation into an animal feed which product, upon being wetted, produces a visually detectable color indicative of the presence of said sulfonamide, which method consists essentially of admixing a minor amount of an approved food color additive with a sulfonamide in the presence of water, and drying the resulting mixture so as to incorporate said food color additive into said sulfonamide thereby producing a sulfonamide-food color additive product which, upon being wetted, produces a visually detectable color indicative of the presence of said sulfonamide.

4,840,910

CONTROLLING SULFIDE SCAVENGER CONTENT OF DRILLING FLUID

Stephen D. Matza, Stafford; William E. Ellington, and Henry C. Fleming, III, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 784,422, Oct. 4, 1985, Pat. No. 4,658,914, which is a continuation-in-part of Ser. No. 609,611, May 14, 1984, abandoned. This application Apr. 20, 1987, Ser. No. 40,414

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.[4] G01N *31/02, 33/24*

U.S. Cl. 436—30 **7 Claims**

1. A process for determining the amount of unspent zinc-containing sulfide scavenger in an aqueous drilling fluid, comprising:

mixing one part by volume of said drilling fluid with about 4 to 10 parts by volume of a selective solvent for zinc ions, such that the solvent provides a pH of about 4 to 6 and is capable of dissolving substantially all of the zinc present in the drilling fluid which has not been combined into molecules of zinc sulfide;

separating the resulting solution from undissolved solids; determining the amount of dissolved zinc present in the solution; and

determining the amount of unspent zinc-containing sulfide scavenger in the aqueous drilling fluid.

4,840,911

USE OF SULFOXIDES FOR TESTING IONIZATION DETECTOR SYSTEM

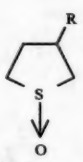
Joseph Epstein, Baltimore; John A. Parsons, Abingdon, and Frank Block, Edgewood, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 28, 1987, Ser. No. 55,811

Int. Cl.[4] G01N *31/00*

U.S. Cl. 436—8 **3 Claims**

1. A method of simulating a positive response of organophosphorus esters to an ionization detector system which comprises forwarding to the ionization detector system a gaseous stream comprising water vapor and a sulfoxide selected from the group consisting of a di (lower alkyl) sulfoxide or a cyclic sulfoxide the latter represented by the formula I:



I

4,840,912

PROCESS FOR DRUG DETECTION

Baruch Glattstein, Jerusalem, Israel, assignor to Erez Forensic Technology, Ltd., Israel

Division of Ser. No. 12,028, Feb. 9, 1987. This application Oct. 11, 1988, Ser. No. 255,989

Claims priority, application Israel, Feb. 12, 1986, 77871; Dec. 3, 1986, 80860

Int. Cl.[4] G01N *33/00, 33/15*

U.S. Cl. 436—92 **10 Claims**

1. A process for the screening of suspect samples for the presence of illicit cocaine and street heroin sufficient to insti-

tute confiscation of such samples, based upon the presumptive indication of their presence which comprises the steps of applying to samples suspected of containing illicit materials selected from the group consisting of cocaine, cocaine-free-base, or street heroin, a reagent which upon contact with such materials gives a characteristic color reaction to the trace amounts of organic bases or acetic acid commonly present and emitted by said materials, said color reaction providing sufficient indication of the presence of said illicit material for confiscation of said suspect samples prior to positive identification of the individual materials by further tests required for proper prosecution.

4,840,913

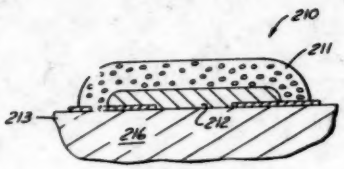
OXIDES OF NITROGEN DETECTOR

Eleftherios M. Logothetis, Birmingham, and Richard E. Soltis, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 927,637, Nov. 6, 1986, abandoned. This application May 19, 1988, Ser. No. 196,813

Int. Cl.[4] G01N *25/22, 27/50*

U.S. Cl. 436—116 **8 Claims**



1. A method of sensing oxides of nitrogen in an ambient gas including other reducing gases including the steps of:

exposing an oxidation catalyst to ambient gas;

passing the ambient gas through the oxidation catalyst which oxidizes the reducing species without affecting any NO_2 present;

positioning the oxidation catalyst between the ambient gas and an oxides of nitrogen semiconductor sensor;

isolating the oxides of nitrogen semiconductor sensor from the ambient gas; and

passing the gaseous output from the oxidation catalyst to the oxides of nitrogen semiconductor sensor to detect the amount of oxides of nitrogen by sensing the change in resistance of the oxides of nitrogen sensor.

4,840,914

GENDER-INDICATING COLORMETRIC TEST ON PREGNANCY URINE AND TEST KIT THEREFOR

Kenneth Weisberg, 606 St. Andrews Rd., Hollywood, Fla. 33021

Filed Sep. 26, 1988, Ser. No. 248,909

Int. Cl.[4] G01N *33/52*

U.S. Cl. 436—183 **9 Claims**

1. A method for the determination of the gender of the unborn child which comprises the steps of:

(a) contacting a sample of the urine from a woman pregnant with the unborn child with a gender-indicating composition;

(b) initiating a chemical reaction between said urine and said composition;

(c) comparing the color developed in the reaction solution as a result of said reaction with standards indicating the gender of said unborn child;

said urine sample being obtained from said pregnant woman during or after the 20th week of the pregnancy; and

said gender-indicating composition comprising an alkali hydroxide and metallic aluminum in 10:1 to 2:1 proportion by weight;

said contacting proportions of said composition to urine being from about 1:1 to about 1:6, weight to volume; said initiation of reaction being caused by the exothermic nature of the reaction;

said color standards for gender determination comprising shades of tan which indicate a female child and shades of brown indicating a male child.

9. A kit for the determination of the gender of an unborn child by reacting with the urine of a pregnant woman, pregnant with said child, which comprises:

(a) kit means enclosing:

(b) a reaction vessel

(c) a portion of a gender-indicating composition

(d) a color standard for comparison;

said reaction vessel having a sufficient capacity to accept a sample of the urine from a pregnant woman and to confine the liquid reactants during the reaction of the urine with the gender-indicating composition; said gender-indicating composition comprising an alkali hydroxide and metallic aluminum, both in particulate form, and said composition portion being an amount sufficient for reacting with the urine and forming a tan or brown solution; said color standard in chart or sample form for use as a comparison standard with said colored solution and having tan standards for female indication and brown standards for male indication.

4,840,915

METHOD FOR DIAGNOSING MALIGNANT TUMORS

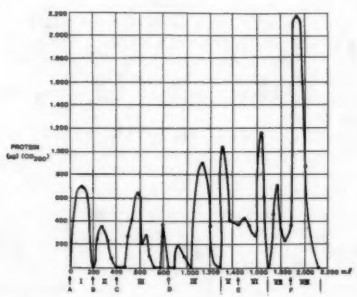
Samuel Bogoch, St. George, Bermuda, assignor to Brain Research, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 281,883, Jul. 9, 1981, and a continuation-in-part of Ser. No. 271,645, Jul. 8, 1981, Pat. No. 4,486,538, each is a continuation-in-part of Ser. No. 922,799, Jul. 7, 1978, Pat. No. 4,298,590, which is a continuation of Ser. No. 19,078, Mar. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 941,940, Sep. 13, 1980, abandoned, which is a division of Ser. No. 852,200, Nov. 17, 1977, Pat. No. 4,196,186, which is a continuation of Ser. No. 621,112, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 553,075, Feb. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 550,432, Feb. 18, 1975, abandoned, and a continuation-in-part of Ser. No. 450,404, Mar. 12, 1974, abandoned, and a continuation-in-part of Ser. No. 385,451, Aug. 3, 1973, abandoned, and a continuation-in-part of Ser. No. 286,172, Jul. 23, 1981, which is a continuation of Ser. No. 101,127, Dec. 7, 1979, abandoned, which is a continuation of Ser. No. 852,200, Nov. 17, 1977, Pat. No. 4,196,186. This application Oct. 3, 1983, Ser. No. 538,492

The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.

Int. Cl.[4] G01N *33/544, 33/531*

U.S. Cl. 436—530 **8 Claims**



1. A method for diagnosing malignant tumors which comprises:

(a) dividing a sample of body fluid into a first and second aliquot;
(b) contacting said first aliquot with a complex of Malignin and an inert carrier for about two hours to allow protein to bind to said complex;
(c) separating from said first aliquot said complex and the protein bound to it;
(d) cleaving the bound protein from said complex;
(e) quantitatively determining the amount of protein cleaved from said complex;
(f) contacting said second aliquot with a complex of Malignin and an inert carrier for about 10 minutes to allow protein to bind to said complex;
(g) separating from said second aliquot said complex and the protein bound to it;
(h) cleaving the bound protein from said complex;
(i) quantitatively determining the amount of protein cleaved from said complex;
(j) comparing the amount of protein determined in step e, above, with that determined in step i, above; and correlating the difference between the two amounts with a predetermined standard value indicative of the tumor, wherein said Malignin is a product, derived from brain tumor cells, which forms a single line precipitate with its specific antibody in quantitative precipitin tests and in Ouchterlony gel diffusion tests, is soluble in water and aqueous solutions having an acid or neutral pH, and insoluble at an alkaline pH, has a spectrophotometric absorption peak wave length of 280 mu, a molecular weight of about 10,000 and an amino acid composition approximately as follows:

	Approximate No. of Residues
Aspartic Acid	9
Threonine	5
Serine	5
Glutamic Acid	13
Proline	4
Glycine	6
Alanine	7
Valine	6
½ Cystine	1
Methionine	2
Isoleucine	4
Leucine	8
Tryosine	3
Phenylalanine	3
Lysine	6
Histidine	2
Argine	5
Approximate Total	89

ammonia and the amino acids cysteic, hydroxyproline, norleucine, isodesmosine, hydroxylysine, lysinonorleucine and gammaaminobutyric acid being absent in detectable amounts.

4,840,916
PROCESS FOR FABRICATING AN AVALANCHE PHOTODIODE

Kazuhito Yasuda, Tokyo, and Yutaka Kishi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 738,723, May 29, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 90,432
Claims priority, application Japan, May 31, 1984, 59-109434
Int. Cl.[4] H01L *31/18*
U.S. Cl. 437—3 **6 Claims**

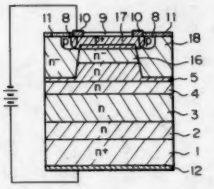
1. A process for fabricating an avalanche photodiode, comprising the steps of:

carrying out a first crystal growth for forming a first semiconductor layer of a first conductivity type on a semiconductor body comprising a light absorption layer;

selectively etching a periphery of said first semiconductor layer to leave the first semiconductor layer in the form of a mesa;

melting-back the exposed surface of the first semiconductor layer in the form of a mesa;

carrying out a second crystal growth for forming a second semiconductor layer on said mesa-etched and melted-back first semiconductor layer; and

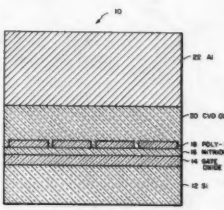


forming an impurity doped region of a second conductivity type extending from the top surface of said second semiconductor layer into the inside of said first semiconductor layer, whereby a p-n junction is defined in said inside of said first semiconductor layer and the remaining portion of said first semiconductor layer where said impurity doped region is not formed defines a multiplication layer.

4,840,917
METHOD OF INTERFACE STATE REDUCTION IN MNOS CAPACITORS

Yea-Dean Sheu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,004
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[4] H01L *21/00, 21/02, 21/477, 29/00*
U.S. Cl. 437—10 **4 Claims**



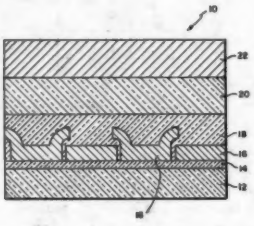
1. A method of reducing the interface state density between Si and SiO_2 in an MNOS (conductor-nitride-oxide silicon) structure, comprising the steps of:

(a) forming an oxide layer over the metal;
(b) forming an unpatterned Al layer over the oxide layer having trace water;
(c) sintering the unpatterned Al layer to generate sufficient hydrogen atoms from trace water in the oxide layer to reduce the interface state between Si and SiO_2.

4,840,918
METHOD OF NOISE REDUCTION IN CCD SOLID STATE IMAGERS

Yea-Dean Sheu, Rochester, and Gilbert Hawkins, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 9, 1988, Ser. No. 191,526
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[4] H01L *21/00, 21/02, 21/477, 31/00*
U.S. Cl. 437—53 3 Claims



1. A method of passivating the surface states of an active layer in a solid state device comprising the steps of:

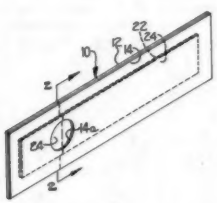
(a) forming an unpatterned Al layer over an oxide layer of the device having trace water;

(b) sintering the unpatterned Al layer to generate sufficient hydrogen atoms from trace water in the oxide layer to passivate surface states on the gate oxide/silicon interface in the device active areas.

4,840,919
GAS DOSIMETER FOR COLORIMETRICALLY INDICATING THE PRESENCE OF AMIDES

Amir J. Attar, Raleigh, N.C., assignor to Perfect View, Inc., Raleigh, N.C.

Filed Mar. 3, 1987, Ser. No. 21,247
Int. Cl.[4] G01N *2/78*
U.S. Cl. 436—111 5 Claims



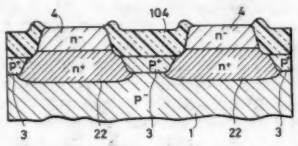
1. A method for colorimetrically indicating the presence of aromatic amines which comprises exposing the aromatic amines to a chromophoric reagent comprising 1,2 naphthoquinone-4-sulfonic acid or a derivative of 1,2 naphthoquinone-4-sulfonic acid and an effective concentration of a buffering agent to maintain the pH of said reagent less than 4.5, and observing the change in color of said reagent.

2. In a gas dosimeter which includes a chromophoric reagent which changes color in response to exposure to specific vapors or gases, the improvement wherein the chromophoric reagent comprises 1,2 naphthoquinone-4-sulfonic acid or a derivative of 1,2 naphthoquinone-4-sulfonic acid and a buffering agent which maintains the chromophoric reagent at a pH less than 4.5.

4,840,920
METHOD OF ISOLATING A SEMICONDUCTOR DEVICE USING LOCAL OXIDATION

Kakutaro Suda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 100,947
Claims priority, application Japan, Jul. 2, 1987, 62-167182
Int. Cl.[4] H01L *29/78, 21/265*
U.S. Cl. 437—69 6 Claims



1. A method of manufacturing a semiconductor device having adjacent ones of element regions isolated by isolation regions, said method comprising:

a first step of successively stacking a first oxide film and a first nitride film on a first conductivity type semiconductor substrate of low impurity concentration;

a second step of removing a plurality of portions of a two-layer film formed by said first oxide film and said first nitride film through etching to form first regions in which two-layer films are left and second regions surrounded by said first regions;

a third step of introducing second conductivity type impurity into said second regions of said semiconductor substrate by utilizing said two-layer films of said first regions as masks;

a fourth step of performing side etching of side walls of said first oxide films by utilizing said first nitride films as masks to retract edges of said first oxide films to prescribe positions in said first regions;

a fifth step of performing selective oxidation by utilizing said first nitride films as masks to form second oxide films being larger in thickness than said first oxide films on said second regions of said semiconductor substrate and on regions exposed in said fourth step within said first regions of said semiconductor substrate;

a sixth step of diffusing said second conductivity type impurity introduced into said second regions of said semiconductor substrate in said third step by heat treatment to form second conductivity type buried layers of high impurity concentration;

a seventh step of introducing, after removing said first nitride films, first conductivity type impurity into only regions having surfaces covred by said first oxide films within said first regions of said semiconductor substrate through said first oxide films by utilizing said second oxide films as masks and further performing heat treatment to form first conductivity type buried layers of high impurity concentration in regions between adjacent ones of said second conductivity type buried layers; and

an eighth step of removing said first oxide films and said second oxide films and forming a second conductivity type epitaxial layer on said semiconductor substrate.

4,840,921
PROCESS FOR THE GROWTH OF III-V GROUP COMPOUND SEMICONDUCTOR CRYSTAL ON A SI SUBSTRATE

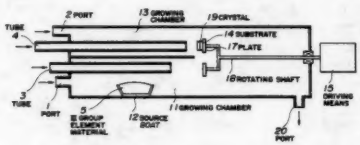
Takashi Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

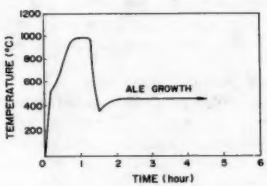
Filed Jun. 30, 1988, Ser. No. 213,940

Claims priority, application Japan, Jul. 1, 1987, 62-165694; Jul. 1, 1987, 62-165695; Jul. 13, 1987, 62-175105; Jul. 14, 1987, 62-176374

Int. Cl.[4] H01L *21/205*

U.S. Cl. 437—89 **5 Claims**





1. A process for the growth of III-V group compound semiconductor crystal on a Si substrate comprising,

placing a Si substrate on a mount positioned in a growing chamber,

heating said Si substrate at a predetermined temperature,

supplying first gas seed including one selected from In and Ga of III group elements, and second gas seed including one of V group elements alternately into said growing chamber, and

growing III-V group compound semiconductor crystal on said Si substrate,

wherein said one selected from In and Ga is a chloride thereof.

4,840,922
METHOD OF MANUFACTURING MASKED SEMICONDUCTOR LASER

Hiroshi Kobayashi, 3-15 Hanakoganei, Kodaira-shi, Tokyo; Haruhiko Machida, 10-7 Nakaochiai 4-chome, Shinjuku-ku, Tokyo; Hideaki Ema, Shizuoka; Jun Akedo, Tokyo; Makoto Harigaya, Yokohama, and Yasushi Ide, Tokyo, all of Japan, assignors to Ricoh Company, Ltd.; Hiroshi Kobayashi and Haruhiko Machida, all of Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 80,389

Claims priority, application Japan, Jul. 29, 1986, 61-178140; Mar. 12, 1987, 62-057784; Jul. 3, 1987, 62-166617

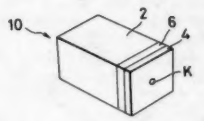
Int. Cl.[4] H01S *3/19*

U.S. Cl. 437—129 **36 Claims**

1. A method of manufacturing a masked semiconductor laser, comprising the steps of:

forming a masking layer capable of cutting off light emitted from a semiconductor laser body on a light-emitting surface of the semiconductor laser body; and

thereafter, removing or making optically transparent a localized portion of said masking layer with light emitted from the semiconductor laser body for thereby defining a light-emitting hole in said masking layer for passage of said light therethrough, wherein said intensity of the light emitted from said semiconductor laser body is adjusted such that the energy of the light is higher than a threshold at which said masking layer is removed or made optically transparent is collected in an area of said light-emitting surface



within the diameter of said light-emitting hole, and wherein said semiconductor laser body is energized in an evacuated vacuum chamber to emit light for forming said light-emitting hole.

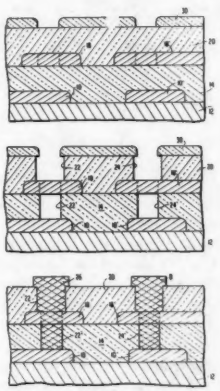
4,840,923
SIMULTANEOUS MULTIPLE LEVEL INTERCONNECTION PROCESS

Donis G. Flagello, Ridgefield, Conn.; Janusz S. Wilczynski, Ossining, and David F. Witman, Pleasantville, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Continuation of Ser. No. 857,275, Apr. 30, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,208

Int. Cl.[4] H01L *21/312*

U.S. Cl. 437—189 **11 Claims**



1. A method of establishing a conductive via path between spaced interlevel conductors comprising the steps of:

defining a first level having a pattern of a conductive material and applying a first dielectric layer over said first level of conductive material:

applying a second level having a pattern of a conductive material with via openings over said first dielectric layer;

applying a second dielectric layer over said second level of conductive material;

creating a via path by opening said dielectric layers through said via openings in said conductive level and terminating said opening at the first conductive level; and

filling said opening with a conductive material.

4,840,924

METHOD OF FABRICATING A MULTICHIP PACKAGE

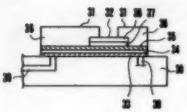
Kouji Kinbara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

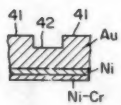
Division of Ser. No. 753,231, Jul. 9, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 115,565

Claims priority, application Japan, Jul. 11, 1984, 59-143581; Jul. 16, 1984, 59-146035

Int. Cl.[4] H01L *21/23*

U.S. Cl. 437—189 2 Claims





1. A method of fabricating a multichip package having an array of contact pads, each pad including a connection conductor portion and a separable conductive portion, particularly for fabricating said contact pad having the ability to make wiring changes, comprising the steps of: forming a multilayer thin film conductive layer comprising chromium, palladium and copper layers on an insulating layer; coating a photoresist on said multilayer thin film conductive layer; implementing exposure and development processes to said photoresist to form a first pattern including said separable conductive portion; implementing a multilayer plating process to form a first wiring layer constituted by nickel and gold plating layers and including said separable conductive portion, thereafter stripping off said photoresist; coating a photoresist on said multilayer thin film conductive layer and said first wiring layer for a second time; implementing exposure and development processes to said photoresist to form a second pattern including said connection conductor portion; implementing a plating process to form a second wiring layer including said connection conductor portion, thereafter stripping off said photoresist; removing the thin film conductive layer except for said first and second wiring layers, thereby completing a conductive portion for soldering; and thereafter forming a solder dam made of a photosensitive polyimide varnish on said insulating layer on which said conductive portion for soldering is formed.

4,840,925

COMPOSITIONS OF TRANSITION METAL MANGANITES IN THE FORM OF PARTICLES OR CERAMICS, THEIR PREPARATION AND THEIR USE IN THE PRODUCTION OF THERMISTORS

Abel C. Rousset, Ramonville St Agne; Guy Boissier, Toulouse; El Hadj Jabry, Benslimane, and Jean-Pierre Caffin, Castres, all of France, assignors to Universite Paul Sabatier (Toulouse III), Toulouse, France

Filed Jun. 4, 1986, Ser. No. 870,355

Claims priority, application France, Jun. 4, 1985, 85 08401

Int. Cl.[4] C04B *35/00*; C01G *45/12*

U.S. Cl. 501—1 14 Claims

1. A composition of a derivative of the manganite type having the formula

$$Mn_{3-x-y-z}Ni_xCo_yM_zO_4 \quad (I)$$

wherein

M represents at least one divalent metal selected from copper, zinc and cadmium,

x, y and z are numbers ranging from 0 to 1, with the sum (x+y+z) being lower than 2,

with the provisos that the numbers x, y and z cannot simultaneously all be equal to zero, that x can range from 0.6 to 1 when y=z=0 and that y can range from 0.6 to 1 when x=z=0;

said composition being in the form

(a) of a particulate composition wherein at least 90 percent of the particles have the following characteristics:

(i) morphology—essentially isotropic form,

(ii) granulometry—a size lower than or equal to 5 micrometers,

(iii) structure—spinel type and

(iv) specific area—greater than 3 m^2/g, or

(b) of a ceramic having a density at least equal to 94 percent of its theoretical density.

4,840,926

HIGH FREQUENCY WAVE ABSORBING CERAMICS

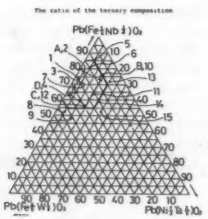
Toshiki Saburi, Anjo; Nobuyuki Ohya, Nagoya; Toru Yamazaki, Kariya, and Taisei Katoh, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 27,071, Mar. 17, 1987, abandoned, which is a continuation of Ser. No. 813,780, Dec. 27, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,712

Claims priority, application Japan, Dec. 28, 1984, 59-280712

Int. Cl.[4] C04B *35/00*

U.S. Cl. 501—134 7 Claims



1. A high frequency wave absorbing ceramics of a ternary composition comprising lead iron niobate $Pb(Fe_{\frac{1}{3}}Nb_{\frac{2}{3}})O_3$, lead iron tungstate $Pb(Fe_{\frac{2}{3}}W_{\frac{1}{3}})O_3$ and lead nickel tantalate $Pb(Ni_{\frac{1}{3}}Ta_{\frac{2}{3}})O_3$,

the composition ratio in the ternary composition lying in the inside (including the boundary) of a quadrangle A—B—C—D in the ternary phase diagram shown in FIG. 1, and the high frequency wave absorbing ceramics having a di-

electric constant of 13,000 or more at a frequency of 1 MHz.

4,840,927

DESENSITIZER COMPOSITION

Shojiro Sano, and Keiso Saeki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1986, Ser. No. 905,206
Claims priority, application Japan, Sep. 9, 1985, 60-198746
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[4] B41M 5/16
U.S. Cl. 503—201 11 Claims

1. A color developer sheet for development of substantially colorless organic color formers comprising a substrate having provided thereon an electron-accepting color developer compound containing layer, said color developer compound containing layer having provided thereon a desensitizer composition consisting essentially of a 2,2,6,6-tetramethylpiperidine compound as a desensitizer and additives comprising a natural or synthetic high-molecular weight compound and a pigment.

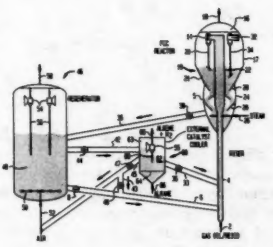
9. A process for forming an image comprising either (i) superposing a color former sheet containing a color former on a color developer sheet and applying pressure to the sheets so as to imagewise effect color formation and development or (ii) imagewise applying ink containing the color former to the color developer sheet so as to effect color formation and development, wherein the color developer sheet comprises a color developer and the desensitizing composition of claim 2.

4,840,928

CONVERSION OF ALKANES TO ALKYLENES IN AN EXTERNAL CATALYST COOLER FOR THE REGENERATOR OF A FCC UNIT

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 144,990
Int. Cl.[4] B01J 38/30; C10G 11/18; C07C 5/333
U.S. Cl. 502—41 12 Claims



1. In a process for regenerating a coke-contaminated fluid cracking catalyst in a regeneration zone at a pressure in the range from above 20 psig to about 50 psig and a temperature in the range from about 1200° F. to about 1500° F. (650° C. to 815° C.) while injecting enough oxygen-containing regeneration gas into said regeneration zone to maintain a dense fluid bed of regeneration catalyst, and regenerate the catalyst before returning it to a fluid cracker, the improvement comprising,

(a) withdrawing a controlled stream of said regenerator catalyst and introducing it into a dehydrogenation zone at a temperature below those prevailing in said regeneration zone, said dehydrogenation zone being located in a catalyst cooler, externally relative to said cracker and regenerator, the amount of said stream being sufficient to supply the endothermic heat of reaction for dehydrogenation of alkanes in said dehydrogenation zone,

(b) introducing a feedstream of said alkanes into said dehydrogenation zone in an amount sufficient to maintain hot withdrawn catalyst in a state of fluidization in said catalyst cooler, said state of fluidization existing in a sub-transport regime operating at a weight hourly space velocity WHSV of said lower alkanes not to exceed 5 hr^{-1} while maintained at a temperature high enough to convert at least 50% of said alkanes, and concurrently to cool said catalyst,

(c) transporting cooled catalyst directly from said dehydrogenation zone, said catalyst now at a temperature in the range from about 1100°–1350° F. (649°–731° C.), to said regeneration zone, and mixing hot catalyst therein with said cooled catalyst, and,

(d) withdrawing products of dehydrogenation in an effluent stream from said catalyst cooler.

4,840,929

ZEOLITE BETA WITH IMPROVED REGENERATION CHARACTERISTICS

Nai Y. Chen, Titusville, N.J., and Sharon B. McCullen, Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 70,607, Jul. 2, 1987, abandoned, which is a continuation of Ser. No. 835,690, Mar. 3, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 218,438
Int. Cl.[4] B01J 29/32
U.S. Cl. 502—74 8 Claims

7. A process for preparing a highly dispersed platinum-containing binder-free Zeolite Beta having a silica-to-alumina mole ratio between 100 and 500, said process comprising:

(a) contacting an as-synthesized Zeolite Beta with an inert gas at a temperature of about 1000° F. at about atmospheric pressure for approximately two hours;

(b) calcining the product of step (a) in an oxygen environment at a temperature of about 1000° F. for approximately two hours;

(c) removing the framework alumina from said Zeolite Beta in the absence of a binder by treatment with acid to the required silica-to-alumina mole ratio;

(d) incorporating said platinum onto the product of step (c);

(e) ammonium-exchanging the product of step (d); and

(f) calcining the product of step (e).

4,840,930

METHOD FOR PREPARING ACID STABLE ZEOLITES AND HIGH SILICA ZEOLITES PREPARED BY IT

Rene B. LaPierre, Medford; Randall D. Partridge, Ewing; Paul T. Reischman, Lambertville, and George T. Kerr, Lawrenceville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 603,388, Apr. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 379,424, May 18, 1982, abandoned. This application Jun. 12, 1986, Ser. No. 874,819
Int. Cl.[4] B01J 29/08
U.S. Cl. 502—79 6 Claims

1. A process for making an acid stabilized zeolite having the structure of a faujasite which comprises calcining a zeolite having the structure of a faujasite in a steam-containing atmosphere comprising at least 10 weight percent steam at increasing temperatures extending over the temperature range of 200° C. to 650° C. wherein the zeolite is heated at a rate greater than 2.0° C. $min.^{-1}$ and less than 4.0° C. $min.^{-1}$ within the range of 200° C. to 500° C. and 0.2° C. to 0.5° C. $min.^{-1}$ within the range of 500° C. to 650° C.; cooling the calcined zeolite; and contacting the cooled calcined zeolite with an acid to remove structural aluminum from the zeolite, to raise the silica:alumina ratio of the zeolite.

4,840,931

METHOD OF INDUCING SURFACE ENSEMBLES ON A METAL CATALYST

Steven S. Miller, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 2, 1987, Ser. No. 103,866

Int. Cl.[4] B01J *31/24, 31/20, 31/18;* C07C *1/04*

U.S. Cl. 502—162 11 Claims

1. A method of inducing surface ensembles on metal catalysts for use in controlling product distribution in the metal-catalyzed conversion of carbon monoxide and hydrogen into hydrocarbons comprising confining a metal catalyst in an evacuated volume at about room temperature, contacting the metal catalyst with a mixture of a gaseous Lewis base and carbon monoxide having a carbon monoxide to Lewis base ratio in the range of about 10 to 120:1 to adsorb the mixture on the surface of the metal catalyst to create reactive ensembles of carbon monoxide on the surface of said catalyst provided by a substantial number of carbon monoxide species being adsorbed on said surface in the vicinity of adsorbed gaseous Lewis base species which tightly bind the carbon monoxide species to the surface of the metal catalyst.

4,840,932

CATALYST FOR PRODUCING 1,4-NAPHTHOQUINONE

Ryo Matsuura, Yamato; Shigeyuki Yoshimura, Tokyo; Yasuo Asanuma, Kamakura; Katsuaki Nasu, Yokohama; Haruo Yoshizumi, Tokyo; Kazumi Tsujimoto, Hatano, and Toshiyuki Kimura, Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Continuation of Ser. No. 748,714, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 176,683, Aug. 8, 1980, abandoned. This application Mar. 16, 1988, Ser. No. 170,057

Claims priority, application Japan, Sep. 5, 1979, 54-112797

Int. Cl.[4] B01J *23/04, 23/22, 35/02*

U.S. Cl. 502—202 8 Claims

1. A molded catalyst having a cylindrical shape, the outer diameter of the circle being from 3 to 5 mm, the inner diameter of the circle being from 1.0 to 2.5 mm , the thickness of the wall being 1.0 to 1.5 mm and the height being from 4 to 6 mm containing a catalytically effective component useful for oxidizing naphthalene to 1,4-naphthoquinone.

4,840,933

HEAT SENSITIVE RECORDING MATERIAL

Toshimasa Usami; Seiji Hatakeyama, and Akihiro Shimomura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 26, 1987, Ser. No. 53,788

Claims priority, application Japan, May 26, 1986, 61-121875; Dec. 8, 1986, 61-292160; Apr. 9, 1987, 62-88197

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—213 8 Claims

1. A heat sensitive recording material which comprises a support having thereon a transparent heat sensitive layer containing at least color former-containing microcapsules and a color developer, said heat sensitive layer being formed using a colorless or light colored precursor of a basic dye as said color former, and according to a process which comprises preparing a coating composition by mixing said microcapsules with an emulsified dispersion prepared by dissolving at least the color developer into an organic solvent slightly soluble or insoluble in water to form an organic phase and then dispersing said organic phase in an aqueous phase containing a protective colloid to form an emulsified composition, coating the resulting composition on the support, and then drying the coat.

4,840,934

THERAPEUTIC METHOD USING T CELL GROWTH FACTOR

David W. Anderson, Littleton, Colo., assignor to Eleanor Roosevelt Institute for Cancer Research, Inc., Denver, Colo.

Division of Ser. No. 460,727, Jan. 25, 1983, Pat. No. 4,623,622. This application Oct. 31, 1986, Ser. No. 925,207

Int. Cl.[4] A61K *37/02, 35/26;* C07J *15/06*

U.S. Cl. 514—2 4 Claims

1. A method of treating a warm blooded mammal for the modification of the mammal's immune system comprising injecting into said mammal an effective amount of the T cell growth factor produced by a process comprising:

(a) cloning and selecting a human ALL cell line from the cell culture identified as HSB-2-ERICR;

(b) culturing the cell line with a tissue culture medium;

(c) contacting the cells so obtained with an inducer which activates or stimulates the production of T cell growth factor; and

(d) recovering the supernatant therefrom containing the T cell growth factor.

4,840,935

PEPTIDE AMINO-ALCOHOL DERIVATIVES CONTAINING A TETRASUBSTITUTED CARBON ATOM, INHIBITING RENIN AND ACID PROTEASES, PROCESS FOR OBTENTION AND THERAPEUTICAL USE

Jean Wagnon, Montpellier; Remy Guegan, Castelnau-le-Lez; Colette LaCour, Montpellier, and Dino Nisato, Saint-Georges d'Orques, all of France, assignors to Sanofi and Institut National de la Sante et de la Recherche Medicale, both of, France

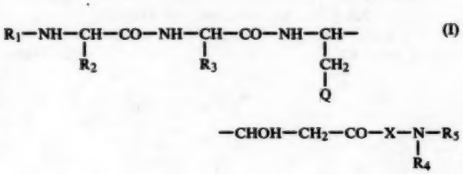
Filed Jul. 16, 1986, Ser. No. 886,070

Claims priority, application France, Jul. 31, 1985, 8511728

Int. Cl.[4] A61K *37/43;* C07K *5/08*

U.S. Cl. 514—18 13 Claims

1. A peptide amino-alcohol derivative of the formula:



(I)

in which:

R_1 represents an acyl group chosen from the following groups: alkylcarbonyl, alkoxycarbonyl, arylcarbonyl, arylalkylcarbonyl, arylalkoxycarbonyl, heterocyclylcarbonyl, heterocyclylalkylcarbonyl, in which the alkyl group is optionally substituted by a hydroxyl group, heterocyclylcarbonylalkylcarbonyl, heterocyclylalkenylcarbonyl and cycloalkylcarbonyl, or represents a (lower alkyl)sulfonyl group which is unsubstituted or substituted on the alkyl by a free amino group or an amino group carrying a protecting group, or by a phenyl, or represents a phenylsulfonyl group which is unsubstituted or substituted on the phenyl nucleus by a lower alkyl;

R_2 represents a lower alkyl group which is unsubstituted or substituted by a phenyl, naphthyl, cyclohexyl or pyridyl, or R_2 represents a phenyl, naphthyl, cyclohexyl or pyridyl radical;

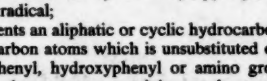
R_3 represents hydrogen, a lower alkenyl, a phenyl, a naphthyl, a cycloalkyl containing 3 to 6 carbon atoms, a 5-membered or 6-membered monocyclic heterocyclic group which is unsubstituted or substituted with a lower alkyl or trifluoromethyl, or alternatively a lower alkyl which is unsubstituted or substituted by a free amino group or an amino group carrying a protecting group, by a di(lower alkyl)amino group, by a free carboxyl or a carboxyl esterified with a lower alkyl or a benzyl, by a

free carbamoyl or a carbamoyl substituted with one or two lower alkyls or with a phenyl, by a hydroxyl, lower alkoxy or benzyloxy group, by a pyridylmethoxy group, by a (lower alkyl)thio, (lower alkyl)sulfinyl or (lower alkyl)sulfonyl group, by a phenyl which is unsubstituted or substituted with a hydroxyl, by a naphthyl, by a cycloalkyl containing from 3 to 6 carbon atoms, by a 5-membered or 6-membered monocyclic heterocyclic group which is unsubstituted or substituted with a lower alkyl or a trifluoromethyl, or by a bicyclic heterocyclic group which is unsubstituted or substituted with a lower alkyl or a trifluoromethyl;

R_4 represents hydrogen or a lower alkyl which is unsubstituted or substituted by an indolyl, pyridyl, imidazolyl or phenyl radical;

R_5 represents an aliphatic or cyclic hydrocarbon group of 3 to 20 carbon atoms which is unsubstituted or substituted by a phenyl, hydroxyphenyl or amino group, the said hydrocarbon group containing at least one hydroxyl group and at least one carbon atom not having a C—H bond;

Q represents isopropyl, phenyl or cyclohexyl, respectively forming with the radical:



the residue of the amino acid Sta, AHPPA or ACHPA; and

X is either a direct bond or the residue of an amino acid such as Ala, Nva, Val, Leu, Nle, Ile, Phg, Abu or Cpg;

and also any pharmaceutically acceptable salts of the said peptide amino alcohol with mineral or organic acids or with alkali metals or alkaline earth metals.

4,840,936

PHARMACEUTICALLY USEFUL DERIVATIVES OF THIAZOLIDINE-4-CARBOXYLIC ACID

Davide Della Bella, Milan; Angelo Carenzi, Busto Arsizio; Dario Chiarino, Monza, and Franco Pellacini, Sesto S. Giovanni, all of Italy, assignors to Zambon S.p.A., Milan, Italy

Filed Jul. 13, 1987, Ser. No. 72,569

Claims priority, application Italy, Jul. 14, 1986, 21112 A/86

Int. Cl.[4] C07D *277/06, 417/06;* **A61K** *31/425*

U.S. Cl. 514—18 **17 Claims**

1. A compound of formula

(I)

in which

Y is hydrogen, or methyl;

R is a radical selected from

(6-methoxy)-2-napthyl)-methyl,

1-(4-isobutylphenyl)-ethyl,

1-(6-methoxy-2-napthyl)-ethyl,

5-(2,4-difluorophenyl)-2-hydroxyphenyl,

2-(3-trifluoromethyl-phenylamino)-phenyl,

(Z)-5-fluoro-2-methyl-1-(4-methylsulfinylbenzylidene)-1H-inden-3-yl-methyl,

1-(4-chlorobenzoyl)-5-methoxy-2-methyl-1H-indol-3-yl-methyl,

1-(3-benzoyl-phenyl)-ethyl,

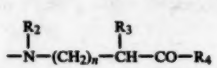
2-(2,6 -dichlorophenylamino)-benzyl,

1-[4-(2-thienyl-carbonyl)-phenyl]-ethyl,

when Y is hydrogen

and is 2-(6-methoxy-2-napthyl)-ethyl when Y is methyl;

R_1 is hydroxy, C_1-C_6 alkoxy, amino, mono- or dialkylamino, in which the alkyl has from 1 to 4 carbon atoms, or an amino-acid radical of the formula

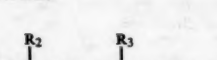


in which

R_2 is hydrogen; R_3 is hydrogen, C_1-C_4 alkyl optionally substituted by SH, SCH_3 or by a phenyl optionally substituted by 1 or 2 hydroxy groups;

n is an integer chosen between 0,1 and 2; when n is 0, R_2 and R_3 together may form a $—(CH_2)_3—$or a $—CH_2—S—CH_2—$group;

R_4 is hydroxy, C_1-C_6 alkoxy or a radical of an amino-acid of formula:



in which R_2, R_3 and n have the above-stated meanings; and their salts with pharmaceutically acceptable acids or bases.

4,840,937

SURFACTANT COMPOSED OF ACYLATED COLLAGEN OR ACYLATED GELATINE AND A PRODUCTION PROCESS THEREOF

Tetsuro Namiki, Ome; Masayasu Furuse, Sagamihara; Yoshimitsu Kuroyanagi, Hachiogi; Teruo Miyata, Tokyo, and Takashi Suzuki, Yokohama, all of Japan, assignors to Koken Co., Ltd. and Shiseido Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 845,442, Mar. 28, 1986, abandoned. This application Sep. 16, 1987, Ser. No. 97,400

Claims priority, application Japan, Apr. 6, 1985, 60-71896

Int. Cl.[4] C08H *1/06;* **C08L** *89/04, 89/06*

U.S. Cl. 514—21 **4 Claims**

1. A non-irritating cosmetic composition for application to the human body comprising an emulsion of water, a cosmetically acceptable oily material, and as an emulsifier, a surfactant comprising an acylated atelocollagen which is the reaction product between atelocollagen and an aliphatic acid having from 2 to 26 carbon atoms or an anhydride thereof reacted at a temperature of about 25° C. or lower and at a pH in the range of from 8 to 14.

4,840,938

PHARMACEUTICAL COMPOSITIONS CONTAINING ANTHRACYCLINE GLYCOSIDES

Gaetano Gatti, Sesto San Giovanni; Diego Oldani, Robecco sul Naviglio; Carlo Confalonieri, Cusano Milanino, and Luciano Gambini, Cornaredo, all of Italy, assignors to Farmitalia Carlo Erba s.r.l., Milan, Italy

Division of Ser. No. 788,158, Oct. 16, 1985, Pat. No. 4,675,311. This application Aug. 6, 1986, Ser. No. 893,613

Claims priority, application United Kingdom, Oct. 22, 1984, 8426672

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—34 **11 Claims**

10. A method of improving the solubility of a lyophilised preparation containing an anthracycline glycoside selected from the group consisting of 4'-epi-doxorubicin, 4'-desoxy-doxorubicin, daunorubicin, 4-demethoxy-daunorubicin, and their pharmaceutically acceptable salts, in an aqueous medium, said method comprising combining the said anthracycline glycoside or a salt thereof with a cosolubilizing agent selected from the group consisting essentially of a hydroxy-, mercapto-, or amino-substituted benzoic acid, an alkali metal salt thereof, a C_1-C_4 alkyl ester thereof, a ring-halogenated methyl-sub-

stituted phenol, an amino acid, and mixtures thereof, and freeze drying the resulting combination, with said anthracycline glycoside or salt thereof remaining in the presence of said cosolubilizing agent.

4,840,939

TREATMENT OF CANCER WITH PHLORIZIN AND ITS DERIVATIVES

Harry H. Leveen, 321 Confederate Cir., Charleston, S.C. 29407; Robert F. Leveen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. Leveen, 141 S. Battery, Charleston, S.C. 29401

Continuation-in-part of Ser. No. 640,170, Aug. 13, 1984, Pat. No. 4,684,627, which is a continuation-in-part of Ser. No. 300,136, Sep. 8, 1981, abandoned. This application Mar. 18, 1987, Ser. No. 27,413

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] A61K *37/02*; C07H *1/00*

U.S. Cl. 514—25 26 Claims

1. A method for inhibiting glucose transport into malignant neoplastic cells which comprises administering an effective amount of a compound or compounds selected from the group consisting of phlorizin, phloretin, phlorizin glucoronide, 4-deoxyphloretin-2-D-glucose, and cytochalasin-B to a human being.

4,840,940

METHOD FOR REDUCING THE OCCURRENCE OF DISTAL ANASTOMOTIC INTIMAL HYPERPLASIA USING FRACTIONATED HEPARIN

Vikrom S. Sottiurai, 5812 Virginia Pl., Metairie, La. 70003

Filed Oct. 21, 1987, Ser. No. 110,730

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—56 9 Claims

1. A method for reducing the occurrence of intimal hyperplasia in grafts of substitute veins and arteries having end-to-side distal anastomosis, the method including administering a region of fractionated heparin to a subject into which said graft has been implanted, wherein said fractionated heparin is selected from the class consisting of fractionated heparin having O-sulfated, N-desulfated and N-acetylated endings.

4,840,941

METHOD FOR INHIBITING INFECTION OF HUMAN T-CELLS

Ryuzo Ueno, Nishinomiya; Ryuji Ueno, Kyoto; Sachiko Kuno, Ibaraki, and Akihiko Tabata, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Japan

Division of Ser. No. 19,180, Feb. 26, 1987. This application Jan. 15, 1988, Ser. No. 144,131

Claims priority, application Japan, Apr. 4, 1986, 61-078470; Apr. 4, 1986, 61-078471; Apr. 21, 1986, 61-093019

Int. Cl.[4] A61K *31/70, 31/72, 31/725*; C08B *37/02*

U.S. Cl. 514—59 11 Claims

1. A method for inhibiting infection of human T-cells by a human retrovirus which comprises providing in the presence of human T-cells susceptible to infection by said human retrovirus an infection inhibiting effective amount of dextran sulfate having a sulfur content of between 13 and 20%.

4,840,942

EMULSIFYING DISPERSANT AND BIOCIDAL COMPOSITION CONTAINING SAME

Tetsuji Iwasaki, and Yoshio Fukui, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 656,835

Claims priority, application Japan, Oct. 14, 1983, 58-192168

Int. Cl.[4] A01N *57/00*

U.S. Cl. 514—120 15 Claims

1. An agricultural biocidal composition which is emulsifiable in water, consisting essentially of: from 10 to 90% by weight of a water-insoluble agricultural biocide selected from the group consisting of pesticides and herbicides, from 15 to 50% by weight of a water-insoluble organic solvent in which said biocide is dissolved and from 1 to 50% by weight of an emulsifier comprising a nonionic surfactant of the formula:

$$R^1—Y^1—(R^3O)_n—Y^2—R^2$$

wherein R^1 and R^2 are each a saturated or ethylenically unsaturated hydrocarbon group, with the proviso that at least one of R^1 and R^2 has at least 8 carbon atoms, Y^1 is -COO- or —O—, Y^2 is —OC— or represents a direct valence bond between $(R^3O)_n$ and R^2, R^3 is C_2–C_4 alkylene, and n is an integer of from 1 to 100.

4,840,943

ANDROST-4-ENE-3,17-DIONES AND PROCESS FOR THEIR PREPARATION

Franco Buzzetti, Monza; Enrico di Salle, and Paolo Lombardi, both of Milan, all of Italy, assignors to Farmitalia Carlo Ebra S.r.l., Milan, Italy

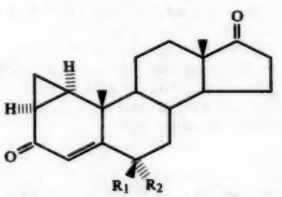
Filed Jun. 15, 1987, Ser. No. 61,663

Claims priority, application United Kingdom, Jun. 20, 1986, 8615092

Int. Cl.[4] C07J *53/00, 75/00*; C07D *31/705, 31/565*

U.S. Cl. 514—177 5 Claims

1. A compound having the formula (I)



(I)

wherein

one of R_1 and R_2 is hydrogen and the other is amino or azido, or R_1 and R_2, taken together, form a $=CH_2$ or $=O$ group, and, when one of R_1 and R_2 is amino, the pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition for inhibiting the biotransformation of androgens into estrogens which comprises an amount of a compound according to claim 1 effective to inhibit the biotransformation of an androgen into an estrogen, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier or diluent.

4,840,944

ANTIBACTERIAL BETA-LACTAMS, PHARMACEUTICALS THEREOF AND METHODS OF USING THEM

Wagn O. Godtfredsen, V rlose, and Welf von Daehne, Rungsted Kyst, both of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

Filed Jan. 24, 1980, Ser. No. 118,063

Claims priority, application United Kingdom, Feb. 13, 1979, 7905020; Jun. 19, 1979, 7921341; Aug. 9, 1979, 7927761; Nov. 14, 1979, 7939473

Int. Cl.[4] A61K *31/43*; C07D *499/32*

U.S. Cl. 514—195 8 Claims

1. 1,1-Dioxopenicillanoyloxymethyl 6-[D-α-amino-α-(p-hydroxyphenyl)acetamido]penicillanate, and salts thereof with pharmaceutically acceptable, non-toxic acids.

5. An antibacterial pharmaceutical composition in dosage unit form for enteral, parenteral or topical treatment of patients which comprises as the active component an antibacterially effective amount of the compound 1,1-dioxopenicillanoylox-

ymethyl 6-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-penicillanate or a salt thereof with a pharmaceutically acceptable, non-toxic acid, together with an atoxic pharmaceutically acceptable carrier.

4,840,945

CEPHALOSPORIN DERIVATIVES

Haruo Ohnishi, Funabashi; Hiroshi Kosuzume, Mishima; Masahiro Mizota, Gotenba; Yasuo Suzuki, Kawaguchi, and Ei Mochida, Toshima, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

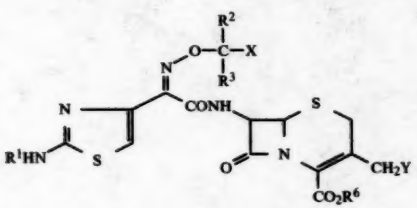
Filed Mar. 10, 1986, Ser. No. 838,309

Claims priority, application Japan, Apr. 1, 1985, 60-68866; May 17, 1985, 60-105704; Jul. 4, 1985, 60-147359; Jul. 27, 1985, 60-166259

Int. Cl.[4] C07D *501/36*; A61K *31/545*

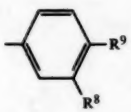
U.S. Cl. 514—206 **12 Claims**

1. A cephalosporin derivative represented by the formula (XIV):

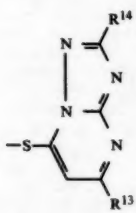


(XIV)

or pharmacuetically or veterinarily acceptable non-toxic salts or solvates or non-toxic salts of solvates thereof: wherein R^1 represents a hydrogen atom or an amino-protecting group, no represents a hydrogen atom, a methyl group, a carboxyl group, or protected carboxyl group, R^3 represents a hydrogen atom or a ethyl group, R^6 represents a hydrogen atom or a carboxy protecting group, X represents a group:



wherein R^8 and R^9 are the same or different and represent hydroxy groups or acetoxy groups, and Y represents a group:



wherein R^{13} represents a methyl group and R^{14} represents a carboxyl group or a protected carboxyl group.

4,840,946

BENZAZOLYTHIO-CARBAPENEM ANTIBIOTICS

Dieter Häbich; Wolfgang Hartwig; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

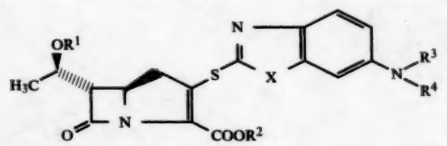
Filed Nov. 12, 1987, Ser. No. 119,752

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640715

Int. Cl.[4] A61K *31/40*; C07D *487/04*

U.S. Cl. 514—210 **10 Claims**

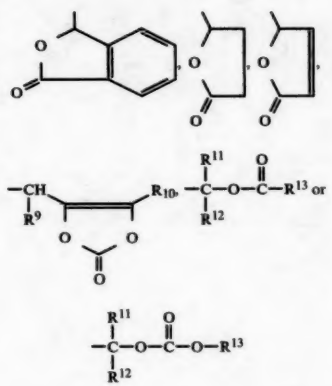
1. A benzazolylthiocarbapenem of the formula



in which

R^1 represents hydrogen, trimethylsilyl, triethylsilyl, triisopropylsilyl, tert.butyl-dimethylsilyl, triphenylsilyl, trimethylsilylethoxy-carbonyl, benzyl, benzyloxycarbonyl, 2-nitrobenzyl, 4-nitrobenzyl, 2-nitrobenzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, tert.butyloxycarbonyl, allyloxycarbonyl, 4-methoxybenzyl, 4-methoxybenzyloxycarbonyl, formyl, acetyl, trichloroacetyl, 2,2,2-trichloroethoxycarbonyl, 2,4-dimethoxybenzyl, 2,4-dimethoxybenzyloxycarbonyl, methoxymethyl, methylthiomethyl, methoxyethoxymethyl, [2-(trimethylsilyl)ethoxy]methyl, 2-(methylthiomethoxy)ethoxycarbonyl, tetrahydropyranyl or benzoyl,

R^2 represents hydrogen, methyl, ethyl, tert.butyl, 2-chloroethyl, 2,2,2-trichloroethyl, cyanoethyl, diphenylmethyl, triphenylmethyl, acetoxymethyl, allyl, benzyl, 4-methoxybenzyl, 2,4-dimethoxybenzyl, 1-phenoxyethyl, 2-methyl-2-propenyl, 4-nitrobenzyl, 2-nitrobenzyl, trimethylsilylethyl or tert.butyldimethylsilylethyl; or a radical from the group consisting of



in which

R^9 and R^{10} are identical or different and represent hydrogen, phenyl or C_1–C_4-alkyl,

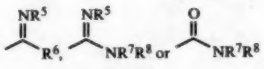
R^{11} and R^{12} are identical or different and represent hydrogen or C_1–C_4-alkyl and

R^{13} represents C_1–C_6-alkyl,

R^3 represents hydrogen or C_1–C_{10}-alkyl, C_6–C_{12}-aryl or C_7–C_{14}-aralkyl,

R^4 represents hydrogen or represents C_1–C_{10}-alkyl, C_6–C_{12}-

aryl or C_7–C_{14} aralkyl, or represents C_1–C_{10}-alkylsulphonyl, C_6–C_{12}-arylsulphonyl or C_7–C_{14}-aralkylsulphonyl, or represents vinyl, allyl, tert.butoxycarbonyl, benzyl, benzyloxycarbonyl, 2-nitrobenzyl, 4-nitrobenzyl, 2-nitrobenzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, 4-methoxybenzyloxycarbonyl, formyl, benzoyl, acetyl, ethylcarbonyl, chloroacetyl, trichloroacetyl, trifluoroacetyl, methyloxycarbonyl, allyloxycarbonyl, trimethylsilyl, triethylsilyl, triphenylsilyl, tert.butyldimethylsilyl, methyldiphenylsilyl, 2,4-dimethoxybenzyl, 2,4-dimethoxybenzyloxycarbonyl, 4-methoxybenzyl, 4-(methoxymethyloxy)phenyl, bis-(4-methoxyphenyl)-methyl, tert.butoxycarbonylmethyl, allyloxycarbonylmethyl, methoxymethyl, methylthiomethyl, methoxyethoxymethyl, [2-(trimethylsilyl)ethoxy]methyl or 2-(methylthiomethoxy)ethoxycarbonyl; or represents a group of the formula



in which

R^5, R^6 and R^8 are identical or different and denote hydrogen, C_1–C_{10}-alkyl, C_6–C_{12}-aryl or C_7–C_{14}-aralkyl,

and

X represents O, S, NH or NCH_3,

or a salt thereof.

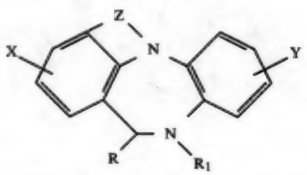
4,840,947

ANTIINFLAMMATORY AND ANALGESIC PIPERIDIN-4-YL-TETRACYCLIC BENZODIAZEPINES AND USE THEREAS

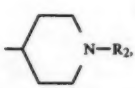
Edward J. Glamkowski, Warren; Yulin Chiang, Convent Station, both of N.J., and Frederick J. Ehrgott, Jr., Norwich, Conn., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Oct. 14, 1986, Ser. No. 918,242
Int. Cl.[4] C07D *487/04;* A61K *31/55*
U.S. Cl. 514—219 **20 Claims**

1. A compound having the formula



where X is hydrogen, loweralkyl, trifluoromlethyl or halogen; Y is hydrogen, loweralkyl, trifluoromethyl or halogen; Z is $—CH_2CH_2—$, —CH=CH— or $—CH_2CH_2CH_2—$; R is



R_2 being hydrogen, loweralkyl, ethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl or phenoxycarbonyl; and R_1 is hydrogen, loweralkanoyl, loweralkyl, ethoxycarbony, 2,2,2-trichloroethoxycarbonyl or phenoxycarbonyl; or a pharmaceutically acceptable acid addition salt thereof.

19. A method of treating a patient in need of relief from inflammation which comprises administering to the patient an effective inflammation-alleviating amount of a compound as defined in claim 1.

20. A method of treating a patient in need of relief from pain which comprises administering to the patient an effective pain alleviating amount of a compound as defined in claim 1.

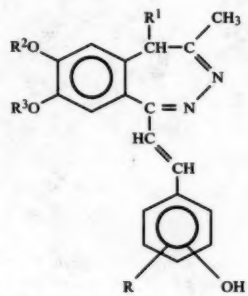
4,840,948

1-(HYDROXYSTYRL)-5H-2,3-BENZODIAZEPINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Tibor Láng; Jeno Korosi; György Rabloczky; Tamás Hámori; Mária Kuhár née Kürthy; István Polgári; István Elekes; Gábor Zólyomi; Krisztina Heltai; Judit Sárossy née Kincsesy; Zsuzsanna Láng née Rihmer, and Imre Moravcsik, all of Budapest, Hungary, assignors to EGIS Gyogyszergyar, Budapest, Hungary

Filed May 20, 1987, Ser. No. 51,777
Claims priority, application Hungary, May 21, 1986, 2140/86
Int. Cl.[4] C07D *243/10;* A61K *31/55*
U.S. Cl. 514—221 **8 Claims**

1. 1-(Hydroxystyryl)-5H-2,3-benzodiazepine derivatives represented by the formula (I),



(I)

wherein

R stands for a hydrogen or halogen atom, or a C_{1-4} alkoxy group,

R^1 represents a hydrogen atom or a C_{1-4} alkyl group,

R^2 and R^3 are identical and denote a C_{1-4} alkyl group, or combined they denote a methylene group.

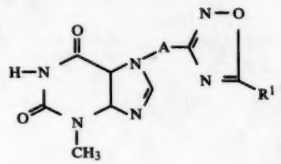
4,840,949

OXADIAZOLE-ALKYL-PURINE DERIVATIVES USEFUL AS ANTITUSSIVE AGENTS

Dezso Korbonits, Budapest; Emil Minker, Szeged; Zoltán Vargai, Budapest; Gergely Héja, Budapest; Gábor Kovács, Budapest; Ágnes Gottsegen, Budapest; Sándor Antus, Budapest; Sándor Virág, Budapest; Andrea Bolehovszky, Budapest; Jeno Marton, Budapest; Katalin Mármarosi née Kellner, Biatorbágy; Lóránd Debreczeni, Budapest; László Tardos, Budapest; Péter Körmöczy, Budapest; Vera Gergely, Budapest, and Gábor Horváth, Budapest, all of Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Oct. 9, 1987, Ser. No. 107,693
Claims priority, application Hungary, Oct. 9, 1986, 4230/86
Int. Cl.[4] A61K *31/52;* C07D *473/06*
U.S. Cl. 514—234.2 **9 Claims**

1. A compound of the Formula I



wherein

A stands for C_{1-4} alkylene and

R^1 represents C_{1-6} alkyl, hydroxyalkyl, halogenoalkyl, carboxyalkyl, C_{5-6} cycloalkyl or aminoalkyl of the general Formula $—(CH_2)_n—NR^2R^3$ in which group n is an integer from 1–3;

R^2 and R^3 each stand for hydrogen or C_{1-4} alkyl or together with the adjacent nitrogen atom they are attached to form a 5- or 6-membered nitrogen containing heterocyclic ring which can optionally contain an oxygen atom or a second nitrogen atom; or

R^1 stands for phenyl, hydroxyphenyl, carboxyphenyl, benzyl or dimethoxybenzyl;

or a physiologically acceptable acid addition salts or salt formed with inorganic bases thereof.

8. An antitussive composition comprising as active ingredient an antitussively effective amount of a compound of the Formula I as defined in claim 1 or a pharmaceutically acceptable salt thereof in admixture with a suitable inert carrier.

9. An antitussive method of treatment which comprises the step of administering to a susceptible animal subject an antitussively effective amount of a compound as defined in claim 1.

4,840,950

4-ARYLCARBONYL-1-[(4-MORPHOLINYL)-LOWER-ALKYL]-1H-INDOLES

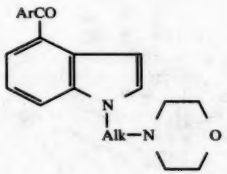
Thomas E. D'Ambra, North Greenbush, and Malcolm R. Bell, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,313

Int. Cl.[4] C07D *413/00*; A61K *31/40*

U.S. Cl. 514—235.2 **7 Claims**

1. A member of the group consisting of (A) compounds having the formula:



where Ar is lower-alkoxyphenyl or 1-naphthyl, and Alk is lower-alkylene containing from one to four carbon atoms; and (B) pharmaceutically acceptable acid-addition salts thereof.

4,840,951

NOVEL NAPHTHALENE DERIVATIVE

Tameo Iwasaki, Nishinomiya, and Kohki Takashima, Tokyo, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaku, Japan

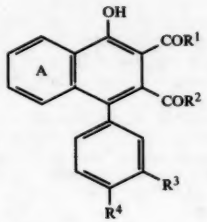
Filed Jun. 17, 1987, Ser. No. 64,293

Claims priority, application Japan, Jul. 1, 1986, 61-155416

Int. Cl.[4] C07C *265/30*; A61K *31/235, 31/535*

U.S. Cl. 514—239.5 **24 Claims**

1. A naphthalene derivative of the formula:



wherein Ring A is an unsubstituted benzene ring, a benzene ring having 1 –3 substituent(s) selected from an alkoxy group and a halogen atom, or a benzene ring substituted with a lower alkylenedioxy group; each of R^1 and R^2 is a group of the formula: $—OR^5$, $—NHR^5$ or

or either one of R^1 and R^2 is a lower alkoxy group and the other one is a group of the formula: $—OR^5$, $—NHR^5$ or

each of R^3 and R^4 is a lower alkoxy group, alkoxy group, or one of R^3 and R^4 is a lower alkoxy group and the other is a hydrogen atom; R^5 is selected from the group consisting of

(i) an alkyl group having at least one substituent selected from the group consisting of a heterocyclic group containing a nitrogen atom, an oxygen atom and/or a sulfur atom, an aryl group, a cycloalkyl group, an alkylthio group, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkoxy-lower alkoxy group, a mono- or di-lower alkylamino group, an amino group, a thiol group, a hydroxy group, a carboxy group and a halogen atom,

(ii) a heterocyclic group containing a nitrogen atom, an oxygen atom and/or a sulfur atom,

(iii) a cycloalkyl group,

(iv) an alkyl group of at least 5 carbon atoms, and

(v) an alkenyl group; and each of R^6 and R^7 is a hydrogen atom or a lower alkyl group, or a salt thereof.

4,840,952

METHOD FOR TREATMENT OF MALE IMPOTENCE

Donald E. Gamble; Harry L. Hunter, and Gordon R. McKinney, all of Evansville, Ind., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 793,821, Nov. 1, 1985, Pat. No. 4,687,771. This application Jul. 8, 1987, Ser. No. 70,851

Int. Cl.[4] A61K *31/50, 31/495*

U.S. Cl. 514—253 **5 Claims**

1. A method for treating male sexual impotence which comprises administering directly to the penis a non-toxic therapeutically effective dose of trazodone or a pharmaceutically acceptable acid addition salt thereof to a patient in need of such treatment.

4,840,953

9-(SUBSTITUTED THIO)-4H-PYRIDO[1,2,-A]PYRIMIDIN-4-ONE DERIVATIVES

Shigeru Matsutani; Yukio Mizushima; Masami Doteuchi, and Yasunobu Ishihara, all of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

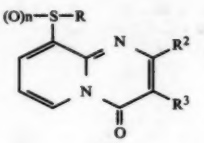
Continuation of Ser. No. 911,359, Sep. 25, 1986, abandoned. This application Jun. 15, 1988, Ser. No. 206,665

Claims priority, application Japan, Sep. 25, 1985, 60-213181; Jan. 21, 1986, 61-11591; Jul. 30, 1986, 61-181159

Int. Cl.[4] C07D *471/04;* A61K *31/505*

U.S. Cl. 514—258 **6 Claims**

1. A compound of the formula:



(I)

wherein

n is 0 or 1,

R is —COR[1],

R[1] is isoxazolyl, oxazolyl or thiazolyl, and

R[2] and R[3] are each hydrogen, C_1–C_5 alkyl, carboxy, C_2–C_5 alkoxycarbonyl or benzyloxycarbonyl, optionally substituted by one or two members selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen.

4,840,954

6,7-DISUBSTITUTED 1-CYCLOPROPLY-1,4-DIHYDRO-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACIDS

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

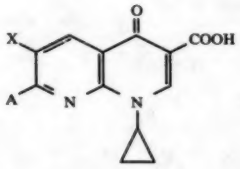
Filed Dec. 31, 1985, Ser. No. 815,440

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 3500562; Mar. 13, 1985, 3508816

Int. Cl.[4] A61K *31/41, 31/436;* C07D *471/04*

U.S. Cl. 514—254 **12 Claims**

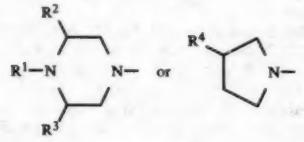
1. A 1-cyclopropyl-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid of the formula



in which

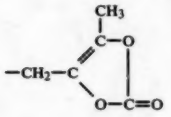
X represents halogen and

A represents



wherein

R[1] represents a branched or straight-chain alkyl group with 1 to 4 carbon atoms, which is substituted by a hydroxyl or methoxy group, a phenacyl radical which is optionally substituted by hydroxyl, methoxy, chlorine or fluorine, 2-oxopropyl, 3-oxobutyl or represents the radical

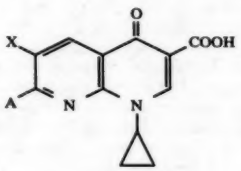


R[2] represents hydrogen or methyl, or phenyl or thienyl which is optionally substituted by chlorine, fluorine, methyl, hydroxyl, or methoxy,

R[3] represents hydrogen or methyl

R[4] represents hydroxymethyl and a pharmaceutically usable hydrate, acid addition salt and alkali metal, alkaline earth metal, silver and guanidinium salt thereof, and the methyl, ethyl, pivaloyloxymethyl, pivaloyloxyethyl or (5-methyl-2-oxo-1,3-dioxol-4-yl-methyl) esters thereof.

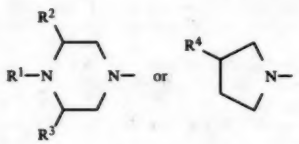
8. A 1-cyclopropyl-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid of the formula



in which

X represents nitro and

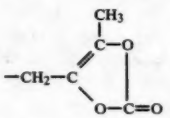
A represents



or halogen,

wherein

R[1] represents hydrogen, a branched or straight-chain alkyl group with 1 to 4 carbon atoms, which can optionally be substituted by a hydroxyl or methoxy group, a phenacyl radical which is optionally substituted by hydroxyl, methoxy, chlorine or fluorine, 2-oxopropyl, 3-oxobutyl, 4-aminobenzyl, formyl or acetyl, or represents the radical



R[2] represents hydrogen or methyl, or phenyl or thienyl which is optionally substituted by chlorine, fluorine, methyl, hydroxyl or methoxy,

R[3] represents hydrogen or methyl and

R[4] represents hydrogen, hydroxyl, amino, alkyl- or dialkylamino with 1 or 2 carbon atoms in the alkyl group, hydroxymethyl, aminomethyl or alkyl- or dialkyl-aminomethyl with 1 or 2 carbon atoms in the alkyl group, and a pharmaceutically usable hydrate, acid addition salt and alkali metal,

alkaline earth metal, silver and guanidinium salt thereof, and the methyl, ethyl, pivaloyloxymethyl, pivaloyloxyethyl or (5-methyl-2-oxo-1,3-dioxol-4-yl-methyl) esters thereof.

4,840,955

6-SUBSTITUTED-2(1H)-QUINOLINONES AND RELATED COMPOUNDS HAVING USE AS CARDIOTONIC, ANTIHYPERTENSIVE, AND ANTITHROMBOTIC AGENTS

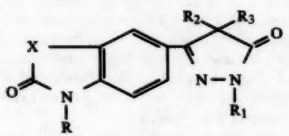
Ila Sircar, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 846,410, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 685,639, Dec. 24, 1984, abandoned. This application Aug. 20, 1987, Ser. No. 87,570

Int. Cl.[4] C07D *401/04, 403/04;* A61K *31/47, 31/415*

U.S. Cl. 514—278 8 Claims

1. A compound having the formula



I

wherein X is $(CH_2)_n$ wherein n is 1 or 2, or $CR_4{=}CR_5$ wherein R_4 and R_5 are independently hydrogen or lower alkyl; R and R_1 are independently hydrogen or lower alkyl; R_2 and R_3 are independently lower alkyl or R_2 and R_3 are taken together with the carbon to which each is attached to form a ring having three to six carbons, inclusive.

4,840,956

NOVEL DISUBSTITUTED-7-PYRROLIDINOQUINOLINE ANTIBACTERIAL AGENTS

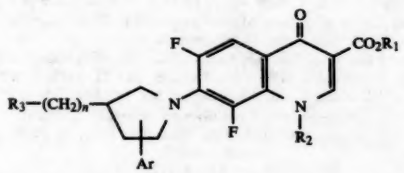
John M. Domagala, Canton; Susan E. Hagen, Ypsilanti; Joseph P. Sanchez, Canton, all of Mich., and Marjorie S. Solomon, Bellevue, Wash., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 831,232, Feb. 18, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 144,301

Int. Cl.[4] A61K *31/47;* C07D *401/04*

U.S. Cl. 514—312 5 Claims

1. A compound having the formula



wherein R_1 is hydrogen or alkyl of one to six carbon atoms; R_2 is cyclopropyl; n is zero R_3 is OR_4, in which R_4 is hydrogen or alkyl of one to six carbon atoms; Ar is phenyl, or a pharmaceutically acceptable acid addition or base salt thereof.

4,840,957

PYRAN DERIVATIVES

Hisashi Takao; Norio Osaki, and Norio Yasudomi, all of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

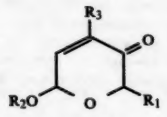
Division of Ser. No. 920,937, Oct. 20, 1986, Pat. No. 4,742,078, which is a continuation of Ser. No. 614,165, May 5, 1984, abandoned. This application Jan. 21, 1988, Ser. No. 146,671

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] A01N *43/40;* C07D *405/06*

U.S. Cl. 514—326 3 Claims

1. A pyran derivative represented by the formula



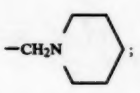
and an acid salt thereof, wherein:

R_1 is lower alkyl, cycloalkyl or phenyl,

R_2 is alkyl having 12 to 20 carbon atoms, and

R_3 is:

(1) the structure of formula (1)

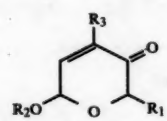


(1)

and

(2) the structure of the above formula (1) wherein at least one hydrogen is substituted by a substituent selected from the group consisting of lower alkyl, lower alkoxy and halogen.

3. A method for controlling mites, consisting essentially of the step of applying to a mite-infested area a miticidal composition which comprises a miticidally effective amount of a pyran derivative represented by the formula



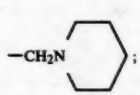
or an acid salt thereof, wherein:

R_1 is lower alkyl, cycloalkyl or phenyl,

R_2 is alkyl having 12 to 20 carbon atoms, and

R_3 is:

(1) the structure of formula (1)



(1)

and

(2) the structure of the above formula (1) wherein at least one hydrogen is substituted by a substituent selected from the group consisting of lower alkyl, lower alkoxy and halogen.

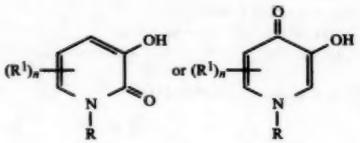
4,840,958
NOVEL 3-HYDROXYPYRID-2-ONES AND 3-HYDROXYPRID-4-ONES USEFUL IN TREATING PATIENTS HAVING A TOXIC CONCENTRATION OF IRON

Robert C. Hider, Essex; George Kontoghiorghes, and Jack Silver, both of London, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 478,493, Mar. 24, 1983, abandoned.
This application Nov. 20, 1986, Ser. No. 933,338
Claims priority, application United Kingdom, Mar. 24, 1982, 8208608
Int. Cl.[4] A61K *31/44*; C07D *211/86*
U.S. Cl. 514—348 17 Claims

1. A method for the treatment of a patient having a toxic concentration of iron in the body, comprising:

administering to said patient by mouth, by the bowel or by parenterally an amount effective to reduce said toxic concentration of a 3-hydroxypyrid-2-one or 3-hydroxypyrid-4-one compound, said compounds having the formula:



wherein

R is an unsubstituted C_1–C_3 hydrocarbon group;

R^1 is an unsubstituted C_1–C_3 hydrocarbon group; and

n is 0, 1 or 2;

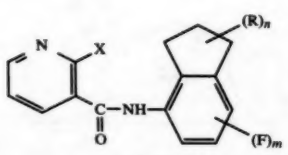
or a physiologically acceptable salt thereof.

4,840,959
PYRIDINECARBOXAMIDE DERIVATIVES AND THEIR USE AS FUNGICIDE

Masatsugu Oda, Yokohama; Naoko Sasaki, Tokyo; Toshiro Sakaki, Yokohama; Hirofumi Tomita, Tokyo, and Nobuyuki Nonaka, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 12, 1987, Ser. No. 84,173
Claims priority, application Japan, Aug. 12, 1986, 61-188936; Oct. 21, 1986, 61-250472; Apr. 13, 1987, 62-90371
Int. Cl.[4] C07D *213/46*; A61K *31/455*
U.S. Cl. 514—355 10 Claims

1. A pyridinecarboxamide derivative having the formula:



wherein X represents a halogen atom, methyl group or trifluoromethyl group, R represents a lower alkyl group or halogen atom, n represents an integer of 1 to 6, and m represents 0 or 1.

4,840,960
TREATMENT OF GLOMERULONEPHRITIS

R. Bernd Sterzel, and Alexander Scriabine, both of Guilford, Conn., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 25, 1987, Ser. No. 89,094
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—356 6 Claims

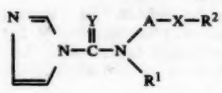
1. A method of treating a patient suffering from glomerulonephritis, the method comprising administering to said patient a therapeutically effective amount of nitrendipine, either alone or in admixture with a pharmaceutically acceptable diluent.

4,840,961
HETEROCYCLIC AMIDE DERIVATIVES

Graham Holmwood, Wuppertal; Joachim Weissmüller, Monheim; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 11, 1986, Ser. No. 851,057
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513259
Int. Cl.[4] C07D *233/90*; A61K *31/415*
U.S. Cl. 514—399 12 Claims

1. A heterocyclic amide derivative of the formula



(I)

in which

R^1 is alkyl with 1 to 12 carbon atoms, alkenyl with 3 to 12 carbon atoms, halogeno-substituted alkenyl with 3 to 12 carbon atoms, alkinyl with 3 to 12 carbon atoms, halogeno-substituted alkinyl with 3 to 12 carbon atoms, alkoxyalkyl with 1 to 6 carbon atoms in the alkoxy part and 2 to 6 carbon atoms in the alkyl part or alkylthioalkyl with 1 to 6 carbon atoms in the alkyl part;

R^2 is naphthyl, naphthyl substituted by a substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, tetrahydronaphthyl, tetrahydrononaphthyl substituted by a substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, indanyl or indanyl substituted by a substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms;

A is an alkylene bridge with 1 to 8 carbon atoms or, if X denotes a direct bond, is also an alkenylene bridge with 1 to 8 carbon atoms;

X is oxygen, sulphur or a direct bond; and

Y is oxygen or sulphur;

or an acid addition salt or a metal salt complex thereof.

10. A method of combating fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound or addition product according to claim 1.

4,840,962
COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Continuation of Ser. No. 16,398, Feb. 19, 1987, abandoned, which is a division of Ser. No. 887,205, Jul. 21, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Mar. 22, 1988, Ser. No. 172,973
Int. Cl.[4] A61K *31/34*, *31/40*, *31/415*
U.S. Cl. 514—406 15 Claims

1. A pharmaceutical composition of matter for use in the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism, and adapted for unit dosage oral administration, said composition comprising (i) an analgesically and

anti-inflammatorily effective amount of a non-narcotic analgesic constituent consisting essentially of at least one of the acetic acid NSAIDs, tolmetin, zomepirac, sulindac, or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) an antihistaminically effective amount of at least one of the antihistamines, chlorpheniramine, brompheniramine, dexchlorpheniramine, dexbromphreniramine, triprolidine, doxylamine, tripelennamine, cyproheptadine, carbinoxamine, bromodiphenhydramine, phenindamine, pyrilamine, azatadine, or pharmaceutically acceptable salt thereof.

4,840,963

2-SULFAMOYL-1H-INDOLE DERIVATIVES FOR THE TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

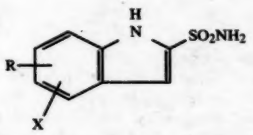
Kenneth L. Shepard, North Wales, and Samuel L. Graham, Harleysville, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 589,385, Mar. 14, 1984, abandoned. This application Dec. 7, 1984, Ser. No. 679,431

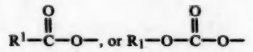
Int. Cl.[4] A61K *31/40;* **C07D** *209/10*

U.S. Cl. 514—418 **2 Claims**

1. A method of treating glaucoma and elevated intraocular pressure which comprises topical ocular application to a patient in need of such treatment of an effective intraocular pressure lowering amount of a compound with structural formula:



or an ophthalmologically acceptable salt thereof, wherein X is hydrogen, R is HO—,



wherein R^1 is C_{1-5}alkyl.

4,840,964

TAURINE DERIVATIVE, ITS PREPARATION AND PHARMACEUTICAL COMPOSIIONS CONTAINING IT

Michele G. Di Schiena, and Vittoria Orru, both of Cisliano, Italy, assignors to Ricerche di Schiena S.n.c. del Dr. Michele G. di Schiena & C., Milan, Italy

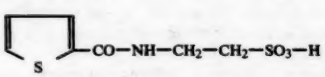
Filed Aug. 22, 1988, Ser. No. 234,181

Claims priority, application Italy, Sep. 18, 1987, 21958 A/87

Int. Cl.[4] A61K *31/38;* **C07D** *333/02*

U.S. Cl. 514—448 **2 Claims**

1. A compound of the formula



and its salts with pharmaceutically acceptable organic or inorganic bases.

4,840,965

NAPHTHALENE ANTI-PSORIATIC AGENTS

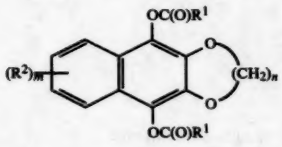
Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco, and John M. Young, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 7, 1987, Ser. No. 70,456

Int. Cl.[4] A01N *43/24, 43/26;* **C07D** *321/10, 319/00*

U.S. Cl. 514—450 **28 Claims**

1. A compound of the formula



(I)

wherein:

m is 1 or 2;

n is 1, 2 or 3;

R^1 is alkyl of one to seven carbon atoms or an optionally substituted phenyl; and

R^2 is hydrogen, lower alkyl of one to six carbon atoms, lower alkoxy of one to six carbon atoms, optionally substituted phenyl, optionally substituted phenyl-lower-alkyyl, optionally substituted phenyl-lower-alkoxy, amino, lower alkylamino, lower dialkylamino, halo, cyano, hydroxy, or lower alkylthio.

4,840,966

METHOD OF TREATING HYPERTENSION

Yukihiko Hara, Shizuoka, and Tateo Suzuki, Sendai, both of Japan, assignors to Mitsui Norin Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,026

Claims priority, application Japan, Mar. 3, 1987, 62-48387

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—456 **10 Claims**

1. A method of treating hypertension to reduce blood pressure or to maintain blood pressure at a desired level comprising administering to a patient in need thereof, an effective amount of at least one tea polyphenol selected from the group consisting of (−)-epigallocatechin gallate, free theaflavin, theaflavin monogallate A, theaflavin monogallate B and theaflavin digallate to maintain or lower blood pressure.

4,840,967

CARBAMATE OR UREA DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS COMPRISING THEM

Nigel Beeley, Combs la Ville, and Gérard Cremer, Morangis, both of France, assignors to Synthelabo, Paris, France

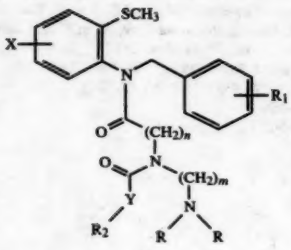
Filed Jul. 7, 1987, Ser. No. 70,580

Claims priority, application France, Jul. 8, 1986, 86 09887

Int. Cl.[4] C07C *149/437;* **A61K** *31/17, 31/27*

U.S. Cl. 514—466 **4 Claims**

1. A compound which is a carbamate or urea derivative of general formula (I)



(I)

wherein
X is hydrogen, halogen or methylthio,
Y is oxygen or

R is C_1–C_4 alkyl,
R_1 is hydrogen, one or two halogen atoms or trifluoromethyl groups, a methyl group, a methoxy group, a cyano group, a nitro group, a methoxycarbonyl group, a methylenedioxy group linked to two adjacent carbon atoms of the benzene ring to which it is attached, or a fused benzo group forming an α-naphthyl or β-naphthyl group with the benzene ring to which it is attached,
R_2 is a linear or branched C_1–C_8 alkyl or alkenyl group optionally substituted with halogen atoms or a methoxy group, a cyclopropylmethyl group, or a phenyl group optionally substituted with one or two halogen atoms or methyl groups,
n is 1 or 2, and
m is 2 or 3, or an addition salt thereof with a pharmacologically acceptable acid.

4,840,968

PREPARATION AND USES OF NEW PROSTAGLANDIN DERIVATIVES WHICH PROTECT CELL MEMBRANES AGAINST ISCHEMIC, PHYSICAL, CHEMICAL, AND BIOLOGICAL INJURIES

Tsuyoshi Ohnishi, 502 King of Prussia Rd., Radnor, Pa. 19087

Continuation-in-part of Ser. No. 104,713, Oct. 2, 1987, abandoned. This application Jan. 25, 1988, Ser. No. 147,839
Int. Cl.[4] C07C *177/00;* A61K *31/557*
U.S. Cl. 514—530 **6 Claims**

1. A method for preparing hydrophobic esters selected from the group consisting of acetoxymethyl and acetoxyethyl esters, said method comprising using oligomers, which are prepared from starting materials, selected from the group consisting of prostaglandin A_1 and prostaglandin E_1 modified by the addition of an alkaline hydroxide material; said method further comprising combining 50 mg of one of the starting materials with 0.5 ml of ethyldiisopropylamine, 0.1 ml chloroform and 2 ml of iso-alcohol; adding 0.2 ml of acetoxymethyl bromide or acetoxyethyl bromide to the mixture and stirring in a stoppered flask for 20 hours evaporating said stirred materials in vacuo, taking up the residue in benzene, and filtering to remove unnecessary byproduct (ethyldiisopropylammonium bromide); reevaporating the benzene solution; extracting the residue with diethyl ether; and evaporating the extract in vacuo overnight.

2. A method of protecting vital organs, such as the brain, spinal cord, heart, lung, liver, kidney, stomach, duodenum and blood vessels against damage caused by (a) ischemic, and (b) spinal cord injuries by administering the ester-compounds of claim 1

(a) orally at a dosage of 10 mg/kg body weight/ day or
(b) subcutaneously or intramuscularly at a dosage of 6 mg/kg body weight/day or
(c) intravenously at a dosage of 2 mg/kg body weight/day.

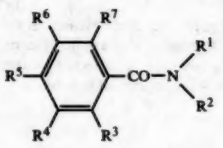
4,840,969

N-SUBSTITUTED BENZAMIDES

Horst Tarnow, Langenfeld, and Bernhard Homeyer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 19, 1987, Ser. No. 27,706
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611193
Int. Cl.[4] A01N *37/40, 37/18, 37/26*
U.S. Cl. 514—617 **6 Claims**

1. A method of combating insects and nematodes comprising applying to said insects or nematodes or to a habitat thereof, an insecticidal or nematicidal effective amount of an N-substituted benzamide of the formula (I)



(I)

in which
R^1 represents hydrogen or alkyl,
R^2 represents halogenoalkyl with more than one carbon atoms, or represents cycloalkyl which is substituted by halogen or halogenoalkyl and R^3, R^4, R^5, R^6 and R^7 are identical or different and represent hydrogen, halogen, nitro, alkyl, halogenalkyl, halogenoalkoxy or halogenoalkylthio, or represent the radical —$CONR^1R^2$.

4,840,970

AQUEOUS SOLUTION CONTAINING LIPID-SOLUBLE PHARMACEUTICAL SUBSTANCE

Hiroyuki Ohasi; Toru Takami, both of Kanagawa; Noritoshi Koyama, Saitama; Yoshio Kogure, Saitama; Katsumi Ida, Saitama; Kazumi Iijima, Gumma, and Tomohiro Kobori, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 634,113, Jul. 24, 1984, abandoned. This application Jun. 1, 1987, Ser. No. 56,302
Claims priority, application Japan, Jul. 25, 1983, 58-134260
Int. Cl.[4] A61K *31/12, 31/07, 31/335, 31/225*
U.S. Cl. 514—690 **9 Claims**

1. In an aqueous solution containing a lipid-soluble source of one or more of vitamins A, E, K or ubiquinone and hydrogenated lecithin in an amount of 0.1 to 15 parts by weight of said lipid-soluble source of said vitamins or ubiquinone, the improvement wherein the solution further comprises a neutral amino acid selected from the group consisting of glycine, alanine, β-alanine, serine, threonine, valine, isoleucine, leucine, phenylalanine, methionine, histidine and taurine incorporated therein in an amount of 0.05 to 6 wt./vol. % of the aqueous solution to adjust the pH of the solution to a range of from 5.5 to 8.

4,840,971

NOVEL ETHER COMPOUND, A PROCESS FOR MANUFACTURING THE SAME, A COMPOSITION CONTAINING THE SAME AND A USE THEREOF

Kazunori Tsushima, Nishinomiya, Japan; Noritada Matsuo, Rochester, N.Y.; Yoo Tanabe, Toyonaka, Japan; Toshihiko Yano, Ikoma, Japan, and Masachika Hirano, Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

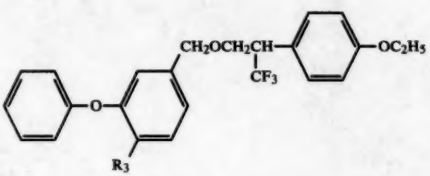
Filed Apr. 2, 1987, Ser. No. 33,245

Claims priority, application Japan, Apr. 7, 1986, 61-79664; Aug. 16, 1986, 61-191833; Feb. 10, 1987, 61-28575

Int. Cl.[4] A61K *31/085*

U.S. Cl. 514—721 6 Claims

1. An ether compound and its optical isomer represented by the formula



wherein R_3 represents a hydrogen or flourine atom.

6. A method for controlling an insect and/or an acarid, which comprises applying an insecticidally and/or acaricidally effective amount of the ether compound according to claim 1 to the insect and the acarid.

4,840,972

RELIEF FROM MEMORY DYSFUNCTION WITH α-ALKYL-4-AMINO-3-QUINOLINEMETHANOLS AND 1-(4-ARALKYLAMINO-3-QUINOLINYL)ALKANONES AND RELATED COMPOUNDS

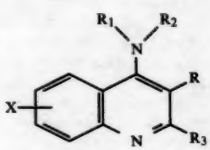
Richard C. Effland, and Joseph T. Effland, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 899,584, Aug. 25, 1986, Pat. No. 4,789,678. This application Nov. 14, 1988, Ser. No. 270,172

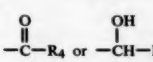
Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—313 1 Claim

1. A method of treating a patient in need of relief from memory dysfunction characterized by decreased cholinergic function, which comprises administering to the patient an effective amount of a compound having the formula



where X is hydrogen, halogen, loweralkyl, loweralkoxy or trifluoromethyl; R is



R_4 being loweralkyl; R_1 is hydrogen, loweralkyl or aryllower-alkyl; R_2 is hydrogen, loweralkyl or arylloweralkyl; and R_3 is loweralkyl, with the proviso that when R is acetyl, R_3 is methyl and X is hydrogen, R_1 and R_2 are not both hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

4,840,973

POLYPROPYLENE RESIN PREFOAMED PARTICLES

Hideki Kuwabara, Hadano, and Shohei Yoshimura, Tomioka, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 858,868, May 1, 1986, abandoned, which is a continuation of Ser. No. 764,979, Aug. 13, 1985, abandoned, which is a continuation of Ser. No. 592,559, Mar. 23, 1984, abandoned. This application Aug. 7, 1987, Ser. No. 82,560

Claims priority, application Japan, Mar. 25, 1983, 58-50048; Apr. 19, 1983, 58-68999

Int. Cl.[4] C08J *9/22, 9/24*

U.S. Cl. 521—58 3 Claims

1. Prefoamed particles consisting essentially of an ethylene/-propylene random copolymer, wherein said prefoamed particles are obtained by foaming particles of an ethylene/propylene random copolymer containing 1 to 4% by weight of random-copolymerized ethylene at a temperature in the range of from Tm - 15° C. to Tm - 5° C. (in which Tm is a temperature at which to terminate melting of the copolymer) and within the range of 141° to 151° C., and wherein said prefoamed particles have a crystal structure characterized in that in a DSC curve obtained by heating 1 to 3 mg of the copolymer prefoamed particles to 220° C. at a heating rate of 10° C./min. with a differential scanning calorimeter, there appear a peak (characteristic peak) characteristic of the copolymer and another peak (high temperature peak) at a higher temperature than a temperature at which the characteristic peak appears.

4,840,974

METHOD FOR REDUCING SILICONE FOAM DENSITY AND SILICONE FOAM COMPOSITIONS

David C. Gross, Schenectady; Larry N. Lewis, Scotia, both of N.Y., and Connie L. Haig, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 226,919, Aug. 1, 1988. This application Dec. 5, 1988, Ser. No. 280,081

Int. Cl.[4] C08G *77/00;* C08J *9/02*

U.S. Cl. 521—85 5 Claims

1. A foamable composition comprising by weight,

(A) 100 parts of a vinyl-terminated polydiorganosiloxane,

(B) 0.5 to 50 parts of a hydride polysiloxane,

(C) 0.2 to 10 parts of a hydroxylated material, and

(D) an effective amount of a platinum catalyst comprising

(i) platinum vinyl siloxane complex, and

(ii) a member selected from a platinum triarylphosphine and a triarylphosphine,

where there is present in the platinum catalyst, per part by weight of platinum of the platinum vinyl siloxane complex, from 0.2 to 4 parts of platinum of the platinum triarylphosphine or 0.2 to 3 parts of the triarylphosphine.

4,840,975

SPHERICAL GRAINS OF POLYAMINO ACID AND PRODUCTION METHOD THEREOF

Chuichi Hirayama, No. 373-12, Shimonabe-machi, Kumamoto-shi, Kumamoto-ken; Yoshiaki Motozato, No. 1174-5, Hotakubohonmachi, Kumamoto-shi, Kumamoto-ken, and Hirotaka Ihara, No. 854-2, Shimizu-machi, Takahira, Kumamoto-shi, Kumamoto-ken, all of Japan, assignors to Chuichi Hirayama; Yoshiaki Motozato; Hirotaka Ihara; Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, all of Kumamoto and Mitsui Toatsu Chemical, Inc., Tokyo, all of, Japan

Continuation-in-part of Ser. No. 878,683, Jun. 26, 1986, abandoned. This application Nov. 3, 1987, Ser. No. 117,925

Claims priority, application Japan, Jun. 27, 1985, 60-141677

Int. Cl.[4] C08V *9/16*

U.S. Cl. 521—183 10 Claims

1. A method for producing porous spherical grains of poly-(α-amino acid), which comprises the steps of preparing a solu-

tion of hydrophobic poly(α-amino acid) dissolved in an organic solvent containing an additive, adding the solution to an aqueous medium and agitating the medium so as to obtain a dispersion of the porous spherical grains of the poly (α-amino acid) dispersed in the aqueous medium while evaporating the organic solvent; and taking out the spherical grains of poly(α-amino acid) from dispersion, wherein the additive is noncompatible with the poly(α-amino acid), compatible with the organic solvent in which the poly (α-amino acid) is dissolved, and which has a higher boiling point than those of the organic solvent and the aqueous medium.

4,840,976

PRODUCTION OF CLOSED-CELLED FOAMS OF HIGH COMPRESSIVE STRENGTH

Reinhold Weber, Mutterstadt; Ludwig Zuern, Bad Durkheim, and Manfred Weilbacher, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,348

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723301

Int. Cl.[4] C08J *9/08, 9/14*

U.S. Cl. 521—79 **1 Claim**

1. A process for producing a closed-celled foam of high compressive strength by extruding a mixture of a styrene polymer and from 8 to 16% by weight, based on the styrene polymer, of a blowing agent and also, optionally, customary additives, which comprises using as the blowing agent a mixture containing

(a) from 2 to 20% by weight of ethyl chloride,

(b) from 2 to 20% by weight of carbon dioxide,

(c) from 20 to 80% by weight of dichlorodifluoromethane and

(d) from 10 to 60% by weight of monochlorodifluoromethane.

4,840,977

POLYMERIC IODONIUM SALTS, METHOD FOR MAKING, AND HEAT CURABLE COMPOSITIONS

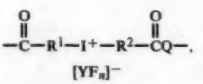
James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1987, Ser. No. 103,156

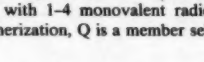
Int. Cl.[4] C08G *79/14;* **C08L** *85/00*

U.S. Cl. 522—25 **15 Claims**

10. Heat curable compositions comprising a cationically polymerizable organic material, a polymeric iodonium salt comprising chemically combined units of the formula



and an effective amount of a copper compound, where R^1 and R^2 are selected from C(6–14) divalent aryl radicals and C(6–14) divalent aryl radicals substituted with 1–4 monovalent radicals inert during interfacial polymerization, Q is a member selected from



and Y is a metal or metaloid selected from P, As, Sb, B, and R^6 is a divalent C(2–30) organo radical.

4,840,978

BLENDS, OF CYCLIC VINYL ETHER CONTAINING COMPOUNDS AND EPOXIDES

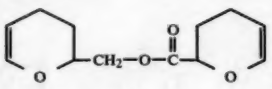
Joseph V. Koleske, Charleston, W. Va., and George T. Kwiatkowski, Green Brook, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 480,473, Mar. 29, 1983, Pat. No. 4,645,781. This application Dec. 22, 1986, Ser. No. 944,871

Int. Cl.[4] C08G *59/26, 59/42, 65/26, 65/14*

U.S. Cl. 522—169 **3 Claims**

1. A photopolymerizable composition comprising 2-(3,4-epoxycyclohexyl-5,5-spiro-3,4-epoxy)-cyclohexane-meta-dioxane, a cyclic ether of the formula:



and a photoinitator.

4,840,979

PROCESS FOR PREPARING CATIONIC COATING COMPOSITIONS USING AMMONIA ADDUCTS OF EPOXY RESINS WHICH ARE FURTHER REACTED WITH A CYCLIC ANHYDRIDE

Roeland Van Iperen; Johannes M. Van Der Mark, and Petrus G. Kooijmans, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 90,277, Aug. 28, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,912

Claims priority, application United Kingdom, Sep. 5, 1986, 8621491

Int. Cl.[4] C08K *5/16;* **C08L** *63/00*

U.S. Cl. 523—404 **19 Claims**

1. A process for preparing a coating composition comprising blending:

(1) from about 5 to about 35 weight percent of a crosslinking compound, and

(2) from about 65 to about 95 weight percent of a carboxylated amide group-containing amino binder which is the reaction product of an amino group-containing resin binder and not more than about 0.1 mol of a cyclic anhydride per amino group equivalent of said amino group containing resin binder, which amino group-containing binder comprises the reaction product of

(a) ammonia, and

(b) a blend of

(b_1) a polyglycidyl ether having n epoxy groups per molecule, wherein $1<n<1.9$, said polyglycidyl ether being the reaction product of a multifunctional polyglycidyl ether having x epoxy groups per molecule, wherein $x>2$, and (x-n) mol of a monofunctional phenol per mol of the multifunctional polyglycidyl ether, and

(b_2) a diglycidyl ether, having an EGC in the range of from 1000 to 5500 mmol/kg,

the average molar epoxy functionality of the glycidyl ethers present in the blend of polyglycidyl ether and diglycidyl ether being less than about 1.75.

4,840,980

METHOD OF STABILIZING EPOXY-POLYAMIDE COATINGS

Alan J. Pekarik, Parma, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 4,624, Jan. 15, 1987, Pat. No. 4,771,088. This application Feb. 29, 1988, Ser. No. 161,963
The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.
Int. Cl.[4] C08K 5/19; C08L 63/00, 77/08
U.S. Cl. 523—456 4 Claims

1. In a method of stabilizing thermosetting epoxy/polyamide coating composition, the improvement comprising:

providing a polymeric mixture of an amino-functional polyamide resin and an epoxy resin adapted to coreact to form a thermoset polymer where the polymeric mixture contains at least 0.1% by weight of a rheology stabilizing additive consisting of an ethoxylated quaternary ammonium salt based on the weight of the polymeric mixture;

wherein said stabilizing additive provides stabilized viscosity and sag resistance of the polymeric mixture during the catalyzed pot life of the polymeric mixture.

4,840,981

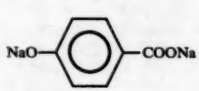
POLYETHYLENE TEREPHTHALATE RESIN COMPOSITION

Masayoshi Hasuo, Yokohama; Seiichi Mukai, Kunitachi; Ryo Saito, and Isao Ikuhara, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 1, 1988, Ser. No. 177,477
Claims priority, application Japan, Apr. 3, 1987, 62-82477; Apr. 3, 1987, 62-82479
Int. Cl.[4] C08K 5/13, 5/09
U.S. Cl. 524—114 3 Claims

1. A polyethylene terephthalate resin composition comprising a polyethylene terephthalate resin and from 0.1 to 3% by weight, based on the polyethylene terephthalate resin, of an aromatic compound of the formula:

(I)



4,840,982

POLYMER BLENDS CONTAINING IONOMERIC ELASTOMERS

John R. Campbell, Clifton Park; Robert E. Williams, Jr., Scotia; Sterling B. Brown, Schenectady, all of N.Y.; Paul M. Conroy, and Robert A. Florence, both of Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 791,881, Oct. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,433, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 528,188, Aug. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 528,189, Aug. 31, 1983, abandoned. This application Aug. 10, 1987, Ser. No. 82,907
Int. Cl.[4] C08K 5/51
U.S. Cl. 524—151 20 Claims

1. A polymer composition comprising:

(A) a major proportion of at least one polyphenylene ether, or a mixture thereof with a styrene homopolymer;

(B) a minor proportion, effective to increase impact resistance, of at least one elastomer substantially free from aromatic moieties, having a carbon atom polymer chain and containing sulfonic or carboxylic acid substituents or salts thereof;

(C) a minor proportion, effective to maintain component B as a substantially stable disperse phase in component A, of at least one substituted aromatic polymer, the substituents thereof being sulfonic or carboxylic acid groups or salts thereof as defined for component B; and

(D) at least one plasticizer, said plasticizer being a polar material melting at least 50° C. below the processing temperature of the resinous components of the composition.

4,840,983

ANTI-TREEING ADDITIVES

Gary A. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

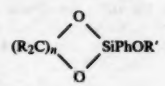
Filed May 23, 1986, Ser. No. 866,413
Int. Cl.[4] C08K 5/04, 5/54
U.S. Cl. 524—265 7 Claims

1. An improved electrical cable insulation material comprised of

(a) polyolefin

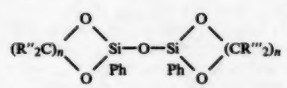
(b) an anti-treeing additive chosen from the group consisting of

(i) a compound represented by the general formula



where each R independently denotes a hydrogen atom, or a saturated hydrocarbon radical; n has a value from 2 to 5; Ph represents an aryl radical; and R′ represents an alkyl radical with 1 to 6 carbon atoms; and

(ii) a compound represented by the general formula



where R″ denotes a hydrogen atom or a saturated hydrocarbon radical, Ph denoted an aryl radical, n has a value from 2 to 5, and at least R″ and one R‴ radical on the oxygen bonded carbon atoms of said general formula denotes an alkyl radical with between 1 and 6 carbon atoms; wherein the polyolefin (a) and the anti-treeing additive (b) are intermixed, and the anti-treeing additive comprises between 0.1 and 5 weight percent of the improved cable insulation material.

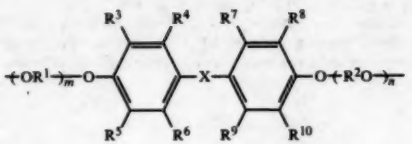
4,840,984

POLYETHYLENE TEREPHTHALATE RESIN COMPOSITION

Akiyoshi Somemiya, Kobe, and Kazushi Hirobe, Osaka, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 58,053, Jun. 4, 1987, Pat. No. 4,742,130. This application Feb. 22, 1988, Ser. No. 158,490
Claims priority, application Japan, Jun. 5, 1986, 61-130578
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] C08L 67/02
U.S. Cl. 524—394 23 Claims

1. A polyethylene terephthalate resin composition suitable for use in moldings which comprises: (A) 5 to 93 parts of a polyethylene terephthalate resin, (B) 95 to 7 parts of a polyethylene terephthalate block copolymer having 10 to 55% by weight of units represented by the formula (I):



(I)

wherein R^1 and R^2 are the same or different and each is a bivalent hydrocarbon group having 2 to 4 carbon atoms, R^3 to R^{10} are the same or different and each is hydrogen atom, a monovalent hydrocarbon group or a halogen atom, X is a bivalent group or single bond, and each of m and n is an integer of 5 to 20, said parts of said components (A) and (B) being parts by weight based on the total amount of said components (A) and (B), and (C) a glass fiber.

4,840,985

GRINDING AGENT BASED AND/OR COPOLYMERS FOR AQUEOUS SUSPENSION OF COARSE MINERAL MATERIALS FOR PIGMENT APPLICATIONS

Olivier Gonnet, St. Andréde Corcy; Georges Ravet, Craponne, and Jacky Rousset, Chatillon sur Chalaronne, all of France, assignors to Coatex, S. A., Caluire, France

Continuation of Ser. No. 881,490, Jul. 1, 1986, abandoned, which is a continuation of Ser. No. 731,752, May 7, 1985, abandoned, which is a continuation of Ser. No. 518,635, Jul. 29, 1983, abandoned. This application Sep. 23, 1987, Ser. No. 102,775

Claims priority, application France, Aug. 6, 1982, 82 14030

Int. Cl.[4] C08J *3/12*

U.S. Cl. 524—425 **15 Claims**

1. A process for the preparation of a stable aqueous mineral suspension, comprising the steps of:

(i) combining (a) water, (b) $CaCO_3$, (c) a grinding agent which is at least one member selected from the group consisting of acrylic acid homopolymers and copolymers which are predominantly acrylic acid and contain at least one monomer selected from the group consisting of methacrylic acid, itaconic acid, crotonic acid, fumaric acid, maleic acid, isocrotonic acid, aconitic acid, mesaconic acid, sinapinic acid, undecylenic acid, angelic acid, hydroxyacrylic acid, acrolein, acrylamide, acrylonitrile, esters of acrylic acid, esters of methacrylic acid, dimethylaminoethyl methacrylate, imidazoles, vinylpyrrolidone, vinylcaprolactam, ethylene, propylene, isobutylene, diisobutylene, vinyl acetate, styrene. alphamethylstyrene and methylvinylketone, wherein from 40 to 80% of the acid groups of said homopolymers and copolymers have been neutralized with neutralizing agents, at least one of which is characterized by a monovalent function, and (d) a grinding material to give a mixture; and

(ii) grinding said mixture to give said stable aqueous mineral suspension such that 95% of the particles are smaller than 2 microns and 75% of the particles are smaller than 1 micron.

4,840,986

PROCESS FOR PRODUCING A POLYARYLENE SULFIDE

Hiroshi Inoue; Toshikazu Kato; Satoshi Tomagou, and Noriaki Emura, all of Mie, Japan, assignors to Tosoh Corporation and Toso Susteel Co., Ltd., Japan

Filed Mar. 7, 1988, Ser. No. 165,062

Claims priority, application Japan, Mar. 6, 1987, 62-49913

Int. Cl.[4] C08G *75/14*

U.S. Cl. 524—436 **5 Claims**

1. A process for producing a polyarylene sulfide through a polymerization reaction between a dihalogenated aromatic compound and an alkali metal sulfide in an aprotic polar solvent at a temperature of from about 200° to about 270° C. for about 0.5 to about 30 hours with stirring, said process comprising adding from about 0.05 to about 5 miles of calcium chloride per mole of the dihalogenated aromatic compound after the conversion of the dihalogenated aromatic compound has reached about 60 to about 98 mol % and allowing the reaction to proceed.

4,840,987

FLAME RETARDANT HEAT-SHRINKABLE TUBE

Yoshito Sakamoto, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Mar. 18, 1988, Ser. No. 169,692

Int. Cl.[4] C08K *3/22*

U.S. Cl. 524—436 **6 Claims**

1. A flame retardant heat-shrinkable tube comprising a cross-linked flame retardant resin composition which consisting essentially of:

(a) 100 parts by weight of an ethylene/vinyl acetate copolymer having a vinyl acetate content of 20 wt % or more based on the total amount of the copolymer or 100 parts by weight of a resin mixture containing a polyolefin resin and an ethylene/vinyl acetate copolymer said resin mixture having a vinyl acetate content of 20 to 40 wt % based on the total amount of said resin mixture, and

(b) from 150 to 250 parts by weight of magnesium hydroxide.

4,840,988

RUBBER COMPOSITION FOR TIRE TREAD

Rinichi Nakayama, Osaka; Yasunori Yoshida, Hyogo, and Satoshi Iwama, Osaka, all of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 157,036

Claims priority, application Japan, Feb. 17, 1987, 62-35304

Int. Cl.[4] C08K *3/04, 5/01;* **C08L** *9/00*

U.S. Cl. 524—476 **7 Claims**

1. A rubber composition for a tire tread for icy and snow covered roads comprising:

diene system rubber in the amount of 100 parts by weight (pbw);

carbon black in the amount of x pbw; and

a softening agent in the amount of y pbw, with the relationship between x and y given by the inequality $(5/8)x-20 \leqq y \leqq x$, said softening agent being selected from the group consisting of z parts by weight of liquid polymer alone and z parts by weight of liquid polymer in combination with naphthene oil, said z parts by weight being selected in compliance with the inequality $(y/5)+5 \leqq z$ with a flow point of said liquid polymer being 20° C. or below and said liquid polymer being selected from the group consisting of one or more of liquid polybutadiene, liquid polybutene, liquid polyisoprene, liquid polyisobutylene and liquid polyisopreneisobutylene.

4,840,989

COPOLYMER MADE FROM N-VINYLAMIDES AND PERFLUOROALKYL GROUP-CONTAINING, ETHYLENICALLY UNSATURATED COMPOUNDS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Holger Ohst, Aachen; Wolfgang Podszun, Cologne; Carlhans Süling, Odenthal; John Goossens, and Günther Penners, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 141,880, Jan. 6, 1988, abandoned. This application Sep. 26, 1988, Ser. No. 249,132

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701408

Int. Cl.[4] C08L *27/12;* **C08F** *12/30*

U.S. Cl. 524—544 **10 Claims**

1. Stabilized aqueous dispersions of inorganic oxides comprising, as a stabilizer, copolymers containing 0.01 to 35 mol-%, relative to the total monomer composition, of one or more polymerized perfluoroalkyl group-containing monomer

units, 55 to 99.99 mole-% of one or more polymerized N-vinylamide monomer units, and 0 to 10 mole-% of one or more further comonomers.

4,840,990

AQUEOUS BINDER DISPERSIONS FOR THE PREPARATION OF PAINTS & FINISHES

Erich Gullbins, Heidelberg; Graham E. McKee, Weinheim, and Gregor Ley, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 90,450, Aug. 18, 1987. This application Sep. 26, 1988, Ser. No. 249,298

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629581

Int. Cl.[4] C08L *51/00*

U.S. Cl. 524—504 **4 Claims**

1. A process for preparing an aqueous binder dispersion, said binder consisting essentially of the following components:

(A) from 0.5 to 50% by weight, based on the binder, of a phenolic resin precondensate;

(B) from 20 to 70% by weight, based on the binder, of a copolymer containing

(b_1) at least one comonomer selected from the group consisting of alkyl acrylates and alkyl methacrylates as the predominant copolymerized unit(s), and

(b_2) at least one comonomer selected from the group consisting of vinylesters of C_2–C_4-carboxylic acids, C_1–C_4-dialkylmaleates and fumarates, vinylaromatics, acrylonitrile, methacrylonitrile, acrylamide, methacrylamide, vinyl ethers of 3 to 10 carbon atoms, vinyl halides, and polyolefinically unsaturated compounds, as the additional copolymerized unit(s) said copolymer (B) containing from 0.1 to 50%, based on (B), of one or more functional groups selected from the group consisting of the glycidyl, carbonyl, N-methylol, N-alkoxymethyl, amino and hydrazo groups; and

(C) from 10 to 70% by weight, based on the binder, of a graft elastomer consisting of diene polymer latex particles grafted with a copolymer containing at least one comonomer selected from the groups consisting of styrene, acrylonitrile, C_1–C_6-alkylacrylates, and C_1–C_6-alkyl methacrylates, as the predominent copolymerized unit(s); comprising the steps of

(i) preparing a primary aqueous dispersion of said graft elastomer (C),

(ii) mixing the said aqueous graft elastomer (C) dispersion with the phenolic component(s) of the said phenolic resin precondensate (A), and thereafter

(iii) condensing the resulting mixture with the aldehyde component(s) of the phenolic resin precondensate (A).

4,840,991

AQUEOUS DISPERSIONS OF PARTIALLY CROSS-LINKED EMULSION COPOLYMERS

Kazys Sekmakas, St. Petersburg Beach, Fla., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 28, 1986, Ser. No. 935,722

Int. Cl.[4] C08K *43/00*

U.S. Cl. 524—812 **11 Claims**

1. An aqueous dispersion of partially cross-linked copolymer particles produced by copolymerizing in aqueous emulsion a mixture of: (A) from 1% to 30% of a dimaleate or difumarate of a trihydric alcohol; (B) from 3% to 30% of hydroxy-functional alkyl acrylate or methacrylate; (C) from 0.5% to 10% of a salt-forming monoethylenically unsaturated monomer selected from monoethylenic carboxylic acid monomer and monoethylenic amine monomer selected from alkylamine acrylates, methacrylates, acrylamides, and methacrylamides; and (D) the balance of the copolymer consisting essentially of at least about 25% of nonreactive copolymerizable monoethylenically unsaturated monomer, said monomers in the absence of the cross-linking provided by said component (A) providing a rubbery copolymer, the copolymer particle-containing suspension produced by said emulsion copolymerization being coagulated with water immiscible organic solvent which is a poor solvent for the copolymer to provide a liquid phase containing the coagulating solvent and the water and surfactants used in said emulsion copolymerization and a coagulum of the copolymer particles therein, said coagulum, after removal of said liquid phase, being dispersed in water with the aid of a salt-forming volatile acid or a volatile base and a water-miscible organic solvent, said last-named solvent being present in said aqueous dispersion in an amount insufficient by itself to dissolve said coagulum in the absence of said salt-forming acid or base.

4,840,992

COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 891,852, Sep. 3, 1986, Pat. No. 4,693,939, which is a division of Ser. No. 731,915, May 8, 1985, Pat. No. 4,618,649, which is a continuation-in-part of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Jun. 17, 1987, Ser. No. 65,890

Int. Cl.[4] C06F *16/06*

U.S. Cl. 525—61 **17 Claims**

1. A non-crosslinked poly(vinyl alcohol) polymer hydrogel which is the reaction product of:

a. a non-crosslinked poly(vinyl trifluoroacetate) polymer which is the reaction product of:

1. vinyl trifluoroacetate monomer, and

2. up to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and co-polymerizable disubstituted ethylenes; and

b. a mild base in a non-aqueous diluent selected so that the poly(vinyl trifluoroacetate) polymer and its poly(vinyl alcohol) polymer solvolysis product are insoluble therein, said poly(vinyl alcohol) polymer being hydrated to provide said hydrogel.

4,840,993

IMPACT-RESISTANT POLYAMIDE MOLDING COMPOUNDS

Wilfried Bartz, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,917

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613528

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] C08L *45/00, 77/00*

U.S. Cl. 525—66 **20 Claims**

1. An impact-resistant polyamide molding compound comprising an intimate mixture of

A. from about 60 to about 98% by weight of a polyamide having an Eta_{rel} value in the range of from about 1.2 to about 2.4

B. from about 2 to about 40% by weight of a polyalkenamer having a viscosity number in the range of from about 50 to about 250 ml/g,

said mixture having been combined with from about 0.05 to about 5% by weight relative to the sum of components A and B, of an organic free radical former at a temperature sufficient to cause said radical former to decompose into free radicals.

7. A molding composition of claim 1 wherein said polyalkenamer is grafted by 0.2 to 5% by weight of an unsaturated monomer containing carboxyl or carboxylic acid anhydride groups.

4,840,994

COMPOSITIONS BASED ON FLUOROELASTOMERS AND ON MODIFIED OLEFINIC POLYMERS

Giovanni Moggi, Milan; Gianna Cirillo, Genova; Mauro Aglietto, and Enzo Benedetti, both of Pisa, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

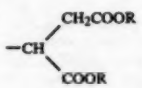
Continuation of Ser. No. 205,175, Jun. 15, 1988. This application Jun. 17, 1988, Ser. No. 208,038

Claims priority, application Italy, Jun. 19, 1987, 20956 A/87

Int. Cl.[4] C08L *51/06, 27/16, 27/18, 27/22*

U.S. Cl. 525—72 5 Claims

1. Fluoroelastomer compositions vulcanizable with peroxide and/or ionic vulcanization, comprising from 0.5 to 5 parts by weight, per 100 parts by weight of fluoroelastomer, of an ethylene homopolymer or of an ethylene/propylene or ethylene/butene-1 copolymer of the amorphous type and containing ester groups —COOR, R=an alkyl with 1 to 8 C, along the polymeric chain, in amounts equal to 0.5%–10% by weight referred to the olefin polymer, said ester groups being bound to carbon atoms of the polymer chain either directly or through a $-CH_2-$ radical or in the form



where R is a C_1–C_8 alkyl group.

4,840,995

AROMATIC POLYESTER/AROMATIC POLYCARBONATE/ALPHA-OLEFIN UNSATURATED CARBOXYLIC ACID REACTION PRODUCT COMPOSITIONS

Mitsuhiko Tamura; Masaaki Miyamoto, and Kazuo Miyamoto, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed May 17, 1988, Ser. No. 194,893

Claims priority, application Japan, May 20, 1987, 62-122859

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—133 8 Claims

1. A resin composition comprising

(a) an aromatic polyester,

(b) an aromatic polycarbonate consisting essentially of carbonate units and

(c) a reaction product of an α-olefin having a molecular weight of 40 to 2,000 and an unsaturated carboxylic acid or a derivative thereof, the content of said unsaturated carboxylic acid or said derivative thereof in said reaction product being 5 to 70 wt %.

4,840,996

POLYMERIC COMPOSITION

Leslie Wild, Wyoming, and Chun D. Lee, Cincinnati, both of Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,435

Int. Cl.[4] C08L *23/26, 23/04*

U.S. Cl. 525—193 8 Claims

1. A composition comprising:

a first ethylene polymer having a density in the range of between about 0.94 and about 0.96 and a melt index in the range of between about 0.05 and about 1.0, said first ethylene polymer present in a concentration of between about 90% and about 97% by weight, based on the total weight of said composition;

a second ethylene polymer having a melt index of at least about 20, said second ethylene polymer present in a concentration of between about 3% and about 10% by weight, based on the total weight of said composition; and

an organic peroxide present in a free radical generating effective amount.

4,840,997

COMPOSITION AND PROCESS FOR MAKING GOLD COLORED OLEFIN POLYMERS

James B. Snell, and Marjorie B. Skinner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 24, 1987, Ser. No. 124,804

Int. Cl.[4] C08L *23/02*

U.S. Cl. 525—210 15 Claims

1. A metallic gold colored composition comprising:

(a) from about 95 to about 98 weight percent olefin polymer, wherein said polymer has a density of greater than or equal to about 0.94 g/cc;

(b) from about 0.5 to about 4 weight percent mica-based gold pigment;

(c) from about 0.01 to about 0.4 weight percent of mica-based bronze pigment; and

(d) from about 0.001 to about 0.006 weight percent carbon black.

4,840,998

MODIFIED POLYTETRAFLUOROETHYLENE FINE POWDER AND PRODUCTION OF THE SAME

Tetsuo Shimizu, Ibaraki, and Kazutaka Hosokawa, Settsu, both of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Aug. 27, 1987, Ser. No. 89,766

Claims priority, application Japan, Aug. 27, 1986, 61-200506

Int. Cl.[4] C08F *259/08*

U.S. Cl. 525—276 9 Claims

1. Modified polytetrafluoroethylene fine powder, which comprises primary particles having a core-shell structure and having an average particle size of 0.1 to 0.6 μm, wherein the core comprises a copolymer consisting essentially of tetrafluoroethylene and 0.01 to 0.15% by weight, based on the total weight of the particles, of at least one olefinically unsaturated compound selected from the group consisting of a fluoroalkyl vinyl ether of the formula:

$$X(CF_2)_nOCF=CF_2$$

wherein X is a hydrogen atom, a fluorine atom or a chlorine atom and n is an integer of 1, 2, 4, 5 or 6 and a fluoroalkyl vinyl ether of the formula:

$$C_3F_7(OCF_2CF_2CF_2)_m[OCF(CF_3)CF_2]_lOCF=CF_2$$

wherein m is an integer of 0 to 2 and l is an integer of 0 to 2 and the shell comprises a copolymer consisting essentially of tetrafluoroethylene and 0.04 to 0.25% by weight, based on the total weight of the particles, of chlorotrifluoroethylene.

4,840,999

DEHYDROGENATED POLYSPIROHEPTADIENE

Bernd Tieke, Marly, and Sheik A. Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

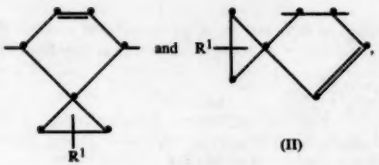
Filed Sep. 11, 1987, Ser. No. 95,075

Claims priority, application Switzerland, Sep. 19, 1986, 3756/86-7

Int. Cl.[4] C08F *8/42*

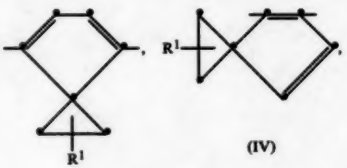
U.S. Cl. 525—332.1 6 Claims

1. A dehydrogenated poly(spiro[2,4]hepta-4,6-diene) which is insoluble in organic solvents having an electrical conductivity of at least 10^{-1} $Sxcm^{-1}$, and containing, relative to the total number of recurring structural units in the polymer, 0–90 mol % of the recurring structural units of the formulae I and II

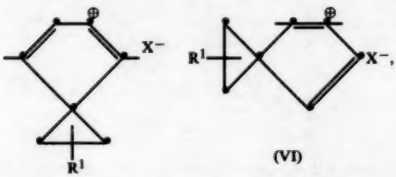


(I) (II)

in which R^1 is in each case a hydrogen atom or an alkyl group having 1 to 4 C atoms, and 10–100 mol % of at least one of the recurring structural units of the formulae III to VI



(III) (IV)



(V) (VI)

in which R^1 is as defined in formula I or II and X^- is a bromide or iodide ion or an anion of a Lewis or protonic acid.

4,841,000

PROCESS FOR THE PREPARATION OF AROMATIC POLYESTERS

Peter Tacke, Krefeld; Ulrich Grogp, Kempen, and Karsten-Josef Idel, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,803

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736650

Int. Cl.[4] C07D *203/18*

U.S. Cl. 525—437 **7 Claims**

1. Process for the preparation of aromatic polyesters based on aromatic diphenols and iso- and terephthalic acid by solvent-free trans-esterification of esters of the diphenols with the aromatic dicarboxylic acids, characterised in that the esters of the diphenols are first reacted with the terephthalic acid alone, and the isophthalic acid is added to the solvent-free reaction mixture after at least 70% of the terephthalic acid put into the process has undergone reaction.

4,841,001

FUNCTIONALIZED THERMOPLASTIC POLYMER HAVING DICYCLOPENTADIENYL GROUPS IN POLYMER CHAIN

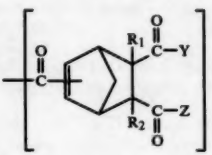
Christopher M. Hawkins, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 16, 1987, Ser. No. 133,861

Int. Cl.[4] C08G *63/62, 63/46*

U.S. Cl. 525—468 **14 Claims**

1. A thermoplastic polymer having recurring aromatic units in the main chain and end groups of the formula



wherein R^1 and R^2 are individually selected from the group consisting of hydrogen, phenyl, an alkyl radical having 1 to 6 carbon atoms, an alkyl substituted phenyl radical having 1 to 14 carbon atoms, chlorine, bromine, an alkoxy radical having 1 to 6 carbon atoms, and cyano; and wherein Y and Z are individually selected from the group consisting of hydroxy, alkoxy, phenoxy and arylamine, and when taken together are an oxygen.

4,841,002

LIQUID AROMATIC BISOXAZOLINE AND DISOXAZINE MONOMER MIXTURES CURED WITH POLYPHENOLIC COMPOUNDS

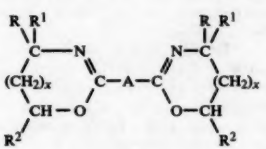
Billy M. Culbertson, Worthington, and Omar Tiba, Dublin, both of Ohio, assignors to Ashland Oil, Inc, Ashland, Ky.

Continuation-in-part of Ser. No. 144,142, Jan. 15, 1988, Pat. No. 4,806,267. This application Nov. 8, 1988, Ser. No. 266,403

Int. Cl.[4] C08G *65/40, 69/44, 69/40*

U.S. Cl. 525—504 **2 Claims**

1. The process for preparing a cured resin comprising reacting a polyphenolic compound with a composition having a melting point below 100° C., said composition consisting of more than two compounds having the formula



wherein

A represents a cyclic or acyclic aliphatic or substituted cyclic or acyclic aliphatic moiety having from 1 to 20 carbon atoms, or an aromatic mono-, or multi-nuclear or aliphatic substituted aryl residue having from 6 to 20 carbon atoms,

R independently represents H, CH_3, CH_2CH_3 or C_6H_5,

R^1 independently represents H or CH_3,

R^2 independently represents H or CH_3, and

x represents an integer of from 0 to 2.

4,841,003
PROCESS FOR PRODUCING OLEFIN POLYMERS

Norio Kashiwa; Akinori Toyota, both of Iwakuni, and Mamoru Kioka, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 783,816, Oct. 7, 1985, Pat. No. 4,725,656, Continuation of Ser. No. 563,824, Dec. 21, 1983, abandoned. This application Sep. 22, 1987, Ser. No. 99,797

Claims priority, application Japan, Dec. 24, 1982, 57-225999

Int. Cl.[4] C08F *4/52, 10/06*

U.S. Cl. 526—125 **11 Claims**

1. A process for producing a polymer or copolymer of an olefin which comprises polymerizing or copolymerizing at least one olefin with or without a diolefin in the presence of a catalyst composed of (A) a magnesium-containing solid titanium catalyst component containing magnesium, titanium, a halogen and an electron donor as essential ingredients and (B) an organoaluminum compound catalyst component; characterized in that

(1) said catalyst further comprises as an outside electron donor (C) an organic silicon compound catalyst component having an Si—O—C or Si—N—C bond, and

(2) said electron donor in the catalyst component (A) is selected from the group consisting of (a) and (d) below,

(a) a mono- or poly-ester of an unsaturated non-aromatic cyclic polycarboxylic acid in which R^1 of the ester moiety —$COOR^1$ is a linear hydrocarbon group, and the non-aromatic ring is a non-heterocyclic ring composed of at least one pair of two adjacent carbon atoms forming a double bond and another carbon atom with at least two carboxyl groups being directly or indirectly bonded to the carbon atoms forming the double bond, and

(d) a mono- or poly-ester of an unsaturated non-aromatic cyclic polycarboxylic acid in which R^4 of the ester moiety —$COOR^4$ is a hydrocarbon group, the non-aromatic ring may contain at least one hetero atom selected from oxygen, nitrogen and sulfur atoms in addition to at least two carbon atoms, and at least two carboxyl groups are bonded directly or indirectly to the non-aromatic ring, provided that when at least one pair of two adjacent carbon atoms forming a double bond exists in the non-aromatic ring, at least one of the carboxyl groups is bonded directly or indirectly to a carbon atom other than the above two adjacent carbon atoms.

4,841,004
PROCESS FOR THE PREPARATION OF A 1-OLEFIN STEREOBLOCK POLYMER

Walter Kaminsky, Pinneberg, and Maria Buschermöhle, Hamburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,342

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640948

Int. Cl.[4] C08F *4/64, 10/06*

U.S. Cl. 526—160 **2 Claims**

1. A process for the preparation of a 1-olefin stereoblock polymer through polymerization of a 1-olefin of the formula R—CH=CH_2 in which R is an alkyl group having 1 to 28 carbon atoms, at a temperature of −60° to 100° C., at a pressure of 0.5 to 60 bar, in solution, in suspension or in the gas phase, in the presence of a catalyst which comprises a transition metal compound and an alumoxane, wherein the polymerization is carried out in the presence of a catalyst whose transition metal compound is bis-neomenthylcyclopentadienyl zirconium dichloride, and where the alumoxane is one of the formula II

$$Al_2OR_4^5[Al(R^5)\text{-}O]_n \quad (II)$$

for the linear type and/or one of the formula III

$$[Al(R^5)\text{-}O]_{n+2} \quad (III)$$

for the cyclic type, where, in the formulae II and III, R^5 denotes methyl, ethyl or isobutyl, and n is an integer from 4 to 20.

4,841,005
TRICYCLODECANE DERIVATIVE

Sinji Tamaru, and Motonobu Kubo, both of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

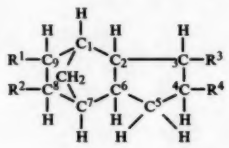
Filed Feb. 12, 1988, Ser. No. 155,608

Claims priority, application Japan, Feb. 12, 1987, 62-30255

Int. Cl.[4] C08F *18/20, 120/22*

U.S. Cl. 526—245 **9 Claims**

1. A tricyclodecane derivative represented by formula (I):



(I)

wherein

R^1 represents a group X^1O— or a hydrogen atom;

R^2 represents a hydrogen atom when R^1 represents a group X^1O—, or R^2 represents a group X^1O— when R^1 represents a hydrogen atom;

wherein X^1 represents a group

$$CH_2{=}CX^2C(=O)-$$

or a hydrogen atom, wherein X^2 represents a hydrogen atom, a methyl group, or a trifluoromethyl group;

R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms, an iodine atom, or a hydrogen atom; and

R^4 represents an iodine atom or a hydrogen atom when R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms, or R^4 represents a fluoroalkyl group containing from 1 to 21 carbon atoms when R^3 represents an iodine atom or a hydrogen atom.

4. A tricyclodecane derivative as claimed in claim 1, wherein

R^1 represents a group

$$CH_2{=}CX^2CO-$$

or a hydrogen atom;

R^2 represents a group

$$CH_2{=}CX^2CO-$$

when R^1 represents a hydrogen atom, or R^2 represents a hydrogen atom when R^1 represents a group

$$CH_2{=}CX^2CO-;$$

R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms or a hydrogen atom; and

R^4 represents a hydrogen atom when R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms, or

R^4 represents a fluoroalkyl group containing from 1 to 21 carbon atoms when R^3 represents a hydrogen atom.

9. A polymer comprising monomeric units derived from said tricyclodecane derivative as claimed in claim 4.

4,841,006

RELEASE COATING-FORMING COMPOSITION

Keiji Kobayashi, and Takashi Urabe, both of Gumna, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,080
Claims priority, application Japan, Aug. 4, 1987, 62-194771
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 **3 Claims**

1. A composition for forming a release coating, comprising:

(A) 100 parts by weight cf a polyorganoborosiloxane having an average composition represented by formula I:

$$R_aSiO_{(4-a)/2}\cdot(BO_{1.5})_b \quad (I)$$

wherein R is a substituted or unsubstituted monovalent hydrocarbon group bonded to a silicon atom, a is a number between 1.8 and 2.2, both inclusive, and b is a positive number, and containing at least 30 ppm by weight, based on the formula (I), of boron atoms in the form of ≡Si—O—B≡ linkages, each molecule thereof containing at least two alkenyl groups bonded to a silicon atom;

(B) a polyorganohydrogensiloxane containing in each molecule at least three hydrogen atoms bonded to silicon atoms in an amount of 0.5 to 10 hydrogen atoms for each of said alkenyl groups in the component (A); and

(C) a catalytic amount of a curing catalyst selected from the group consisting of platinum and platinum compounds.

4,841,007

FLUORINATED POLYETHERURETHANES AND MEDICAL DEVICES THEREFROM

Richard J. Zdrahala, Dayton, and Marc A. Strand, Centerville, both of Ohio, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 28, 1988, Ser. No. 173,892
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—28 **11 Claims**

1. A thermoplastic polyetherurethane consisting substantially of a product from the reaction of a diisocyanate, a fluorinated polyol, a nonfluorinated polyol selected from the group consisting of a polyalkyleneoxide polyol and a polyester polyol and a chain extender of 2 to 12 carbon atoms selected from the group consisting of a diol, diamine and amino alcohol.

4,841,008

COATING COMPOSITIONS

Takashi Tsukamoto, Suita; Toyoji Hatta, Ikeda, and Ichiro Minato, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 4, 1988, Ser. No. 228,317
Claims priority, application Japan, Aug. 11, 1987, 62-201407; Aug. 11, 1987, 62-201408
Int. Cl.[4] C08G *18/80*
U.S. Cl. 528—45 **8 Claims**

1. A polyurethane coating composition which comprises:

(a) a polyisocyanate blocked with an oxime or a lactam; or a polyurethane prepolymer having terminal isocyanate groups blocked with an oxime or a lactam;

(b) a polyaminepolyetherpolyester which is a condensate of a polyaminepolyether and an organic carboxylic acid, the polyaminepolyether being an adduct of an oxirane compound to a polyamine compound, a polyamidepolyaminepolyether which is an adduct of an oxirane compound to a polyamidepolyamine, the polyamidepolyamine being a condensate of a polyamine and an organic carboxylic acid; or a mixture of the polyaminepolyetherpolyester and the polyamidepolyaminepolyether.

4,841,009

SUBSTANTIALLY LINEAR MONOMERIC COMPOSITION AND LIQUID CRYSTAL POLYMERIC COMPOSITIONS DERIVED THEREFROM

Donald R. Kelsey, Hillsborough, N.J., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 454,179, Dec. 28, 1982, abandoned. This application Jul. 5, 1985, Ser. No. 752,010
Int. Cl.[4] C07C *69/017, 39/21, 103/133, 87/80*; C07D *209/56, 277/70*; C08G *73/16, 73/08, 65/40, 63/62*
U.S. Cl. 528—75 **46 Claims**

46. A substantially linear polymeric composition having repeating units of the formula:

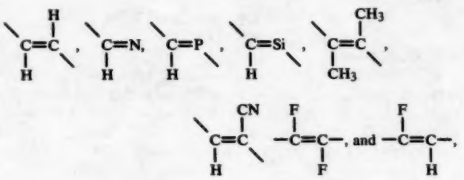
$$-(-Z-R^1-R_m{}^2-R_n{}^3-R^4-Z)-(-Q-)-$$

wherein

R^1 and R^4 are individually a substituted or unsubstituted aromatic or heteroaromatic group having from 5 to about 20 carbon atoms,

R^2 is a substituted or unsubstituted aromatic, heteroaromatic or cycloaliphatic group having from 5 to about 20 carbon atoms,

R^3 is selected from the group consisting of:



Z is oxygen or nitrogen, and

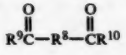
wherein

m has a value of at least 2 and n has a value of at least 1 such that the aspect ratio of the composition is from about 3.5 to about 7.0 and, when m and/or n are values of 2 or greater,

R^2 and R^3 individually can be the same or different groups, and

the R^2 and R^3 group(s) can be arranged in any order provided two or more R^3 groups are not directly connected to each other with a chemical bond; and Q is the residuum of a difunctional monomer selected from the following:

(1) a difunctional monomer having the formula:

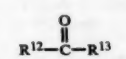


wherein

R^8 is a substituted or unsubstituted alkyl group having from 1 to abouto 20 carbon atoms or a substituted or unsubstituted aromatic, heteroaromatic or cycloaliphatic group having from 5 to about 20 carbon atoms and

R^9 and R^{10} are individually halogen or — OR^{11} wherein R^{11} is hydrogen or a substituted or unsubstituted alkyl, aryl or arylalkyl group having from 1 to about 20 carbon atoms, with the proviso that when R^9 and/or R^{10} are halogen or when R^9 and/or R^{10} are —OR^{11} wherein R^{11} is not hydrogen, then E^1 and/or E^2 in the substantially linear monomeric composition are a hydroxyl radical or an amino radical;

(2) a difunctional monomer having the formula



wherein R^{12} and R^{13} are individually halogen or — OR^{14} in which R^{14} is a substituted or unsubstituted alkyl, aryl or arylalkyl group having from 1 to about 20 carbon atoms;

(3) a difunctional monomer having the formula

$$R^{13}—Ar—R^{16}$$

wherein Ar is the residuum of a benzenoid compound having at least one electron withdrawing group in one or more of the positions ortho or para to R^{15} and R^{16} and wherein R^{15} and R^{16} are individually halogen, $—NO_2$, $—OSOR^{17}$ or $—O-SO_2R^{18}$ in which R^{17} and R^{18} are a substituted or unsubstituted hydrocarobon group; and

(4) a difunctional monomer having the formula

$$O=C=N—R^{19}—N=C=O$$

wherein R^{19} is a substituted or unsubstituted alkyl, aryl or arylalkyl having from 1 to about 20 carbon atoms.

4,841,010
TRIGLYCIDYL ETHER/TETRAGLYCIDYL ETHER/ALKADIENE RUBBER/POLYALKYLENE POLYAMINE FORMULATION

Hanna Dodiuk, Haifa, Israel, assignor to State of Israel, Ministry of Defence, Armament Development Authorithy, Rafel, Haifa, Israel

Filed Sep. 2, 1987, Ser. No. 92,380
Int. Cl.[4] C08G *59/56, 59/58*
U.S. Cl. 528—99 **18 Claims**

1. A twin-pack system for producing epoxy resins which retain mechanical and adhesive properties at elevated temperatures, up to about 120° C., and which can be cured at ambient or slightly elevated temperatures,

wherein pack (1) comprises in combination:

a. a tetraglycidyl diamino-diaromatic alkane, and

b. a triglycidyl ether of an amino aromatic compound; and

wherein pack (2) comprises in combination: a curing system consisting of:

a. a polyalkylene-polyamine; and

b. an aminoterminated or carboxyterminated alkadiene rubber compound.

4,841,011
PREPARATION OF ARYLENE OLIGOMERS

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, United Kingdom

Filed Sep. 11, 1987, Ser. No. 96,414
Claims priority, application United Kingdom, Sep. 30, 1986, 8623511
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[4] C08G *8/02, 14/00*
U.S. Cl. 528—125 **22 Claims**

1. A method of preparing an arylene oligomer having the repeat unit:

ti -Ar-O-Ar-B-

where

each B independently is a carbonyl (—CO—) or sulphonyl (—SO_2—) group, and each Ar is independently a substituted or unsubstituted phenylene moiety or a substituted or unsubstituted polynuclear moiety, aromatic carbon atoms of which are bonded directly to the —O— or —CO— or SO_2 groups,

which comprises oligomerising a monomer system comprising (I) phosgene or an aromatic or aliphatic carboxylic or sulphonic diacid dihalide monomer and a polynuclear aromatic comonomer having two activated hydrogens or (II) a self-oligomerising polynuclear aromatic monomer containing both a carboxylic or sulphonic acid halide group and an active hydrogen atom, in a reaction medium comprising:

(A) a Lewis acid;

(B) a controlling agent comprising:

(i) $R(OX)_a$ or added water which must be present in the reaction medium together with the Lewis acid before any monomer containing acid halide groups is added,

(ii) $R(COOX)_a$,

(iii) $R(SO_3X)_a$, or

(iv) $(RO)_b Y$, which, if the Y-O linkage(s) are reactive to acid halide groups, must be present in the reaction medium together with the Lewis acid before any monomer containing acid halide groups is added,

where R is a monovalent or polyvalent organic group compatible with the monomer(s) and the other components of the reaction medium,

each X independently is a hydrogen atom or a monovalent metal atom,

each a independently is 1 or 2,

Y is a multivalent metal atom, and

b is an integer equal to the valency of Y; and

(C) optionally a non-protic diluent;

the various components being present in such proportions and the oligomerisation being conducted under such reaction conditions that a substantially linear arylene oligomer substantially free of pendant groups resulting from ortho substitution of para-linked aromatic rings in the oligomer back-bone is obtained either in a dispersed state, in which case the group R of the controlling agent (B) preferably has fewer than 8 aliphatic carbon atoms directly bonded to one another, or in a solution or gel state.

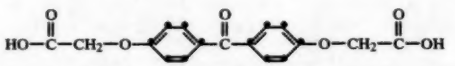
4,841,012
POLYESTERS WITH IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 25, 1988, Ser. No. 236,382
Int. Cl.[4] C08G *63/66*
U.S. Cl. 528—125 **4 Claims**

1. A polyester having an inherent viscosity of at least 0.5 measured at 25° C. in a 60/40 by weight mixture of phenol/tetrachloroethane at a concentration of 0.5 g/100 mL comprising the polyester reaction product of:

(A) a dicarboxylic acid corresponding to the structure



and

(B) a diol selected from the group consisting of ethylene glycol, 1,4-butane diol and 1,4-cyclohexanedimethanol.

4,841,013
PREPARATION OF POLY(ARYLENE ETHER KETONES)

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, England

Filed Sep. 11, 1987, Ser. No. 96,415
Claims priority, application United Kingdom, Sep. 18, 1986, 8622475; Oct. 8, 1986, 8624172
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[4] C08G *8/02, 14/00*
U.S. Cl. 528—125 **22 Claims**

1. A method of preparing a poly(arylene ether ketone) having the repeat unit:

—Ar—O—Ar—CO—

where each Ar is independently a substituted or unsubstituted phenylene moiety or a substituted or unsubstituted polynuclear moiety, aromatic carbon atoms of which are bonded directly to the —O— or —CO— groups, which comprises polymerising a monomer system comprising (I) phosgene or an aromatic or aliphatic diacid dihalide monomer and a polynuclear aromatic comonomer having two activated hydrogens or (II) a self-

polymerising polynuclear aromatic monomer containing both an acid halide group and an active hydrogen atom, in a reaction medium comprising:

(A) a Lewis acid;

(B) a controlling agent comprising:

(i) $R(OX)_a$ or added water which must be present in the reaction medium together with the Lewis acid before any monomer containing acid halide groups is added,

(ii) R(COOX)hd a,

(iii) $R(SO_3X)_a$, or

(iv) $(RO)_b$ Y, which, if the Y—O linkage(s) are reactive to acid halide groups, must be present in the reaction medium together with the Lewis Acid before any monomer containing acid halide groups is added,

where

R is a monovalent or polyvalent organic group compatible with the monomer(s) and the other components of the reaction medium,

each X independently is a hydrogen atom or a monovalent metal atom,

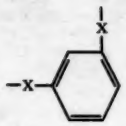
each a independently is 1 or 2,

Y is a multivalent metal atom, and

b is an integer equal to the valency of Y; and

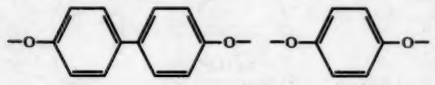
(C) optionally a non-protic diluent;

the various components being present in such proportions and the polymerisation being conducted under such reaction conditions that a thermally stable, substantially linear poly(arylene ether ketone) substantially free of pendant groups resulting from ortho substitution of para-linked aromatic rings in the polymer backbone is obtained *either* in a dispersed state, in which case the group R of the controlling agent (B) has fewer than 8 aliphatic carbon atoms directly bonded to one another, *or* in a solution or gel state.



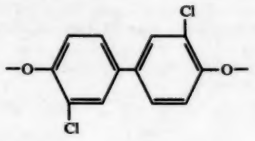
wherein X=C=O or —O—, in proportions of 0 to 15 mole percent,

(d) units of at least one of formulas



in proportions of 0 to 33 mole percent, and

(e) units of the formula



in proportions of 2 to 40 mole percent.

4,841,014

MELT-PROCESSABLE, THERMOTROPIC, FULLY AROMATIC POLYESTERS

Walter Brodowski, Amorbach, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 23, 1988, Ser. No. 210,428

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721256

Int. Cl.[4] G08G *63/18, 63/68*

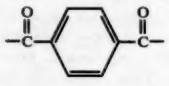
U.S. Cl. 528—191 **13 Claims**

1. A melt-processable, thermotropic, fully aromatic polyesters, consisting essentially of

(a) repeating units of the formula

in proportions of 20 to 70 mole percent,

(b) units of the formula



in proportions of 10 to 40 mole percent,

(c) one or both, units of the formula

wherein X=C=O or —O—, in proportions of 0 to 15 mole percent,

(d) units of at least one of formulas

in proportions of 0 to 33 mole percent, and

(e) units of the formula

in proportions of 2 to 40 mole percent.

4,841,015

LOW PLATE-OUT POLYCARBONATE END CAPPED WITH PHENOXY ACETIC ACID

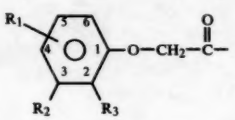
Daniel W. Fox, Pittsfield; Edward N. Peters, Lenox, and Paul D. Sybert, Pittsfield, all of Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 22, 1987, Ser. No. 136,664

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—198 **8 Claims**

1. An aromatic polycarbonate resin having a polymer chain terminated with a monovalent group of the formula:



wherein R_1, R_2, and R_3 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl having from 1 to 12 carbon atoms, inclusive and halogen substituted hydrocarbyl of 1 to 12 carbon atoms, inclusive: R_1 is attached to a carbon atom at one of the ring positions 4, 5 or 6; and R_2, and R_3 when taken together represent the divalent moiety of the formula:

—CH=CH—CH=CH—

which effectively creates an additional fused aromatic ring structure.

4,841,016

POLYESTER RESIN COMPOSITIONS

Bill R. Edwards, 1733 N. Parkdale, Wichita, Kans. 67212

Filed Mar. 16, 1988, Ser. No. 168,895
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 **12 Claims**

1. An additive composition for enhancing the curing and color clarity properties of a polyester resin at ambient temperatures in the presence of an oxidizing agent wherein the polyester resin is substantially free of amines and metal constituents, the additive composition comprising:

from about 50 to about 75 parts by weight of a mercaptan; and

from about 50 to about 25 parts by weight of a quarternary ammonium salt.

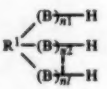
4,841,017

POLYETHER COMPOUNDS, EPOXY RESINS AND PROCESSES FOR PRODUCTION THEREOF

Takaaki Murai, and Katsuhisa Sakai, both of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

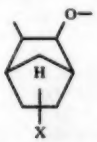
Filed Mar. 11, 1988, Ser. No. 167,680
Claims priority, application Japan, Aug. 17, 1987, 62-203919; Aug. 18, 1987, 62-204868; Aug. 25, 1987, 62-212139; Aug. 31, 1987, 62-215526
Int. Cl.[4] C08G *59/02*; C07D *303/12*
U.S. Cl. 525—327.3 **7 Claims**

1. An epoxy resin represented by formula (II)

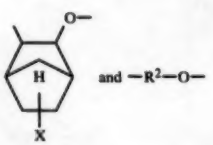


(II)

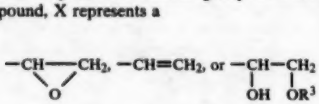
wherein R^1 represents a residue group of an organic compound having l active hydrogen atoms, n1 through n_l each represents 0 or an integer of from 1 to 100, the sum of integers represented by n1 through n_l is from 1 to 100, and l represents an integer of from 1 to 100, and B represents an oxynorbornane unit having a substituent



or a mixture of

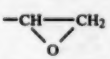


wherein R^2 represents a residue group of a mono epoxy compound, X represents a



group,

wherein R^3 represents a hydrogen atom, an alkyl group, an alkylcarbonyl group or an arylcarbonyl group, provided that the epoxy resin represented by formula (II) contains at least one



group.

4,841,018

CATALYTIC PREPARATION OF POLY(ARYLENE SULFIDE) FROM HALOTHIOPHENOL

Roger G. Gaughan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 664,734, Oct. 25, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 96,220
Int. Cl.[4] C08G *75/02*
U.S. Cl. 528—374 **33 Claims**

1. A process for the preparation of a poly(arylene) sulfide comprising:

contacting, in an alkaline reaction medium, a halothiophenol and a catalyst comprising a compound selected from the group consisting of palladium complex compounds in which the palladium has a valence state of zero, nickel complex compounds in which the nickel has a valence state of zero or two, and nickel halides in which the nickel has a valence state of two, in an alcohol solvent under polymerization conditions effective for producing the poly(arylene sulfide); and,

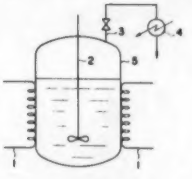
recovering the poly(arylene sulfide).

4,841,019

APPARATUS FOR PRODUCING POLYARYLENESULFIDES

Takao Iwasaki, and Katsumi Horikosi, both of Iwaki, Japan, assignors to Kureha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 751,843, Jul. 5, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 23,966
Claims priority, application Japan, Jul. 11, 1984, 59-143828
Int. Cl.[4] B01J *19/02*
U.S. Cl. 528—388 **6 Claims**



1. In a process for producing a polyarylenesulfide by reacting a hydrous alkali metal sulfide with a dihaloaromatic compound in an aprotic polar organic solvent in a corrosion-resistant apparatus, the improvement wherein the process is carried out in an apparatus comprising at least one process vessel wherein at least the liquid-contacting parts of said apparatus are constructed of titanium thereby to produce a polyarylenesulfide having a molecular weight larger than polyarylenesulfide which is produced in an apparatus made of stainless steel.

4,841,020

CATALYTIC POLYMERIZATION OF CARBON MONOXIDE WITH FUNCTIONAL SUBSTITUTED ETHYLENICALLY UNSATURATED MONOMER

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 21, 1987, Ser. No. 98,652

Claims priority, application Netherlands, Nov. 27, 1986, 8603015

Int. Cl.[4] C08G 67/02

U.S. Cl. 528—392 13 Claims

1. The process of producing linear alternating polymers of carbon monoxide and a functionally substituted ethylenically unsaturated compounds wherein the functional substituent is separated from the ethylenic unsaturation by at least one —CH_2— bridging group, by contacting carbon monoxide and the functionally substituted ethylenically unsaturated compound under polymerization conditions in the presence of a catalyst composition formed from a palladium compound, the anion of a non-hydrohalogenic acid having a pKa less than about 6 and a bidentate ligand selected from bidentate phosphorus ligand and bidentate nitrogen ligand.

4,841,021

POLYPYRIDINIUM

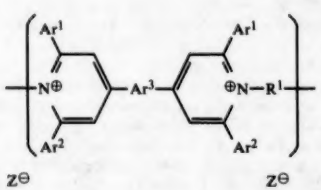
Alan R. Katritzky, Gainesville, Fla.; Larry R. Krepski, White Bear Lake, Minn.; Jerald K. Rasmussen, Stillwater, Minn.; Steven M. Heilmann, Afton, Minn., and Richard D. Tarr, Toledo, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 30, 1987, Ser. No. 126,590

Int. Cl.[4] C08G 33/02

U.S. Cl. 528—407 10 Claims

1. A polymer comprising dipyridinium units having the formula:



wherein Ar^1, Ar^2, and Ar^3 are the same or different aromatic or heteroaromatic group each of which contains one ring or two fused or catenated rings having 5 to 12 ring carbon or heteroatoms, R^1 is any divalent organic bridging group, and $Z^{\ominus}$ is a counterion.

4,841,022

METHOD FOR REMOVING IMPURITIES FROM POLYPHENYLENE SULFIDE RESIN

Yoshiaki Nakamura, Chiba; Kiichi Marukawa, Yokohama, and Kazuyoshi Nagaki, Chiba, all of Japan, assignors to Tohpren, Co., Ltd., Japan

PCT No. PCT/JP87/00179, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO87/05915, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 24, 1987, Ser. No. 131,047

Int. Cl.[4] C08G 75/02

U.S. Cl. 528—487 6 Claims

1. A method for removing impurities from a polyphenylene sulfide resin, which comprises heat-mixing a powdery polyphenylene sulfide resin with a solvent selected from the group consisting of:

(I) at least one solvent selected from the group consisting of dimethylsulfoxide, sulfolane, glycerol, and a combination of ethylene glycol or diethylene glycol with dimethylsulfoxide, sulfolane or glycerol,

(II) a mixed solvent of a solvent selected from the group consisting of dimethylsulfoxide, sulfolane, glyceral, thylene glycol and diethylene glycol with an α-halogenated aphthalene or biphenyl,

(III) a mixed solvent of the mixed solvent (II) or at least one solvent selected from the group consisting of benzyl alcohol, sulfolane and glyceral with N-methyl-2-pyrrolidone and

(IV) a mixed solvent of the solvent (I) or N-methyl-2-pyrrolidone with water

to bring the powder and the solvent sufficiently in contact with each other in the partially dissolved state, cooling and filtering the mixture, and washing the filter cake with a solvent incapable of dissolving the polyphenylenesulfide resin therein.

4,841,023

INACTIVATION OF VIRUSES IN LABILE PROTEIN-CONTAINING COMPOSITIONS USING FATTY ACIDS

Bernard Horowitz, New Rochelle, N.Y., assignor to New York Blood Center, Inc., New York, N.Y.

Filed Jun. 25, 1986, Ser. No. 878,446

The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.

Int. Cl.[4] A61K 39/18, 39/29

U.S. Cl. 530—351 28 Claims

1. A process for rendering a labile protein-containing composition substantially free of lipid-containing viruses without incurring substantial protein denaturation comprising contacting said composition with an effective amount of fatty acid having at least 16 carbon atoms or a salt or a monoglyceride thereof for a sufficient period of time and at a temperature of 0° C. to 37° C.

4,841,024

PURIFICATION OF ANTIBODIES

Gene R. Nathans, Columbia, and Robert W. Rosenstein, Ellicott City, both of Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 15, 1986, Ser. No. 907,404

Int. Cl.[4] C07R 3/12

U.S. Cl. 530—387 8 Claims

1. A process for purifying I(g)G3 antibody, comprising:

contacting a liquid containing I(g)G3 antibody with an affinity matrix for I(g)G3 antibody which is maintained at a pH of at least 9.0 and no greater than 9.6 to adsorb I(g)G3 antibody; releasing adsorbed I(g)G3 antibody from the affinity matrix; and collecting released I(g)G3 antibody in an eluate which is at a pH of at least 9.0 and no greater than 9.6.

4,841,025

ANTIBODY PREPARATIONS

Stephen P. Cobbold, and Herman Waldmann, both of Cambridge, England, assignors to National Research Development Corporation, London, United Kingdom

Continuation of Ser. No. 624,205, Jun. 25, 1984, abandoned.

This application Mar. 21, 1988, Ser. No. 171,164

Claims priority, application United Kingdom, Jul. 8, 1983, 8318575

Int. Cl.[4] A61K 39/395; C07K 3/12

U.S. Cl. 530—387 15 Claims

1. A monoclonal antibody preparation, comprising intact IgG antibody molecules having a single binding activity, which activity is in respect of a cell surface antigen of a target cell, and having only one of the two light chains which will bind to the antigen, the other non-binding light chain being characteristic of a cell not specifically to the antigen from which the source hybridoma derives, the proportion of such antibody molecules relative to IgG antibody molecules having

two light chains which will bind to the antigen being about 10:1 or more to thereby produce an enhancement of the binding activity of the mixture of the antibody molecules as originally secreted.

4,841,026

VIRALLY INACTIVATED, NON-TOXIC, HUMAN TRANSFERRIN PREPARATION

Shirley M. Van Beveren, and Albert R. Pappenhagen, both of Concord, Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 27, 1987, Ser. No. 7,150
Int. Cl.[4] C07K *15/14, 3/24*
U.S. Cl. 530—394 **10 Claims**

1. A method of preparing a sterile, virally inactivated, human, non-toxic, stable transferrin preparation, comprising of steps of

(a) fractionating human plasma to obtain partially purified transferrin solution;

(b) adding a soluble iron salt to the solution of Step (a) in the proportion of at least 1.3 milligrams of iron per gram of transferrin;

(c) reacting said iron salt with said transferrin to form a saturated transferrin -iron complex and removing the non-complexed iron from the solution;

(d) separating non-transferrin proteins from the solution of step (c); and

(e) heating the iron-containing transferrin obtained in step (d) in order to inactivate viruses.

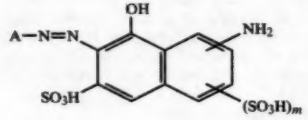
4,841,027

PROCESS FOR PREPARING PHENYL- AND NAPHTHYLAZO-AMINONAPHTHOL SULPHONIC ACIDS

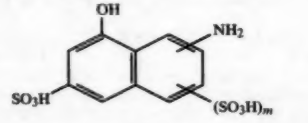
Yutaka Kayane, Moriguchi; Takashi Omura, Ashiya; Yasuo Tezuka, Nara, and Hideharu Sone, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 377,054, May 11, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 700,063
Claims priority, application Japan, May 14, 1981, 56-73191
Int. Cl.[4] C09B *41/00, 41/136, 62/028, 62/51*
U.S. Cl. 534—599 **4 Claims**

1. A process for producing an arylazo-aminonaphtholsulfonic acid represented by a free acid of the formula,



wherein A is a phenyl or naphthyl group unsubstituted or substituted by one to four members selected from alkyl, alkoxy, phenoxy, sulfonic acid, carboxylic acid, arylamino, amino, nitro and hydroxyl groups and halogen atoms, and m is 0 or 1, which comprises reacting an aminonaphtholsulfonic acid represented by a free acid of the formula,



wherein m is as defined above, with a dibasic acid anhydride selected from the group consisting of maleic anhydride and succinic anhydride to obtain an acylaminonaphtholsulfonic acid, coupling a diazonium compound of amine of the formula,

$$A'—NH_2$$

wherein A' is a phenyl or naphthyl group unsubstituted or substituted by one to four members selected from alkyl, alkoxy, phenoxy, sulfonic acid, carboxylic acid, arylamino, maleinylamino, nitro and hydroxyl groups and halogen atoms, with the acylaminonaphtholsulfonic acid, and then subjecting the resulting coupling product to hydrolysis in the presence of an acid or an alkali.

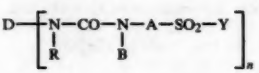
4,841,028

REACTIVE DYES COMPRISING A REACTIVE RADICAL BONDED TO THE CHROMOPHOR BY A UREA BRIDGE MEMBER

Peter Aeschlimann, Sandweg 16, 4123 Allschwil, and Hansrudolf Schwander, Unterm Schellenberg 189, 4125 Riehen, both of Switzerland

Continuation of Ser. No. 913,557, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 771,128, Aug. 30, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 86,173
Claims priority, application Switzerland, Aug. 30, 1984, 4155/84
Int. Cl.[4] C09B *62/527, 52/525, 62/535, 62/537*
U.S. Cl. 534—629 **18 Claims**

1. A reactive dye of the formula



(I)

in which D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarbimide dye, R is hydrogen or C_1–C_4-alkyl which is unsubstituted or is substituted by halogen, hydroxyl, cyano, C_1–C_4-alkoxy, carboxyl or sulfo, A is straight-chain or branched C_2–C_6-alkylene which is unsubstituted or is substituted by chlorine, bromine, fluorine, hydroxyl, sulfato, C_1–C_4-alkanoyloxy, cyano, carboxyl, alkoxycarbonyl having 1 to 5 C-atoms or carbamoyl, or is alkyleneoxyalkylene having 1 to 6 C-atoms in each alkylene member, independently of each other; Y is $—CH=CH_2$ or $—CH_2—CH_2—Z$, Z is $—OSO_3H$, $—SSO_3H$, $—OCOCH_3$, $—OPO_3H_2$ or Cl, B is (a) hydrogen (b) C_1–C_6-alkyl which is unsubstituted or is substituted by halogen hydroxyl, cyano, C_1–C_4-alkoxy, carboxyl or sulfo, (c) C_7–C_{20}-alkyl, (d) cyclohexyl, (e) phenyl which is unsubstituted or is substituted by mtehyl, ethyl, methoxy, ethoxy, chlorine, bromine, carboxyl, sulfo or sulfomethyl or (f) a radical of the formula

$$—A—SO_2—Y$$

wherein A and Y are as defined above and n is 1 or 2.

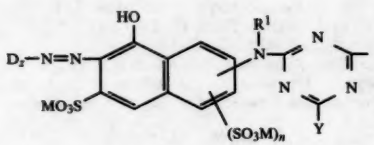
4,841,029

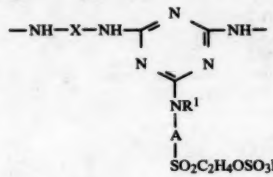
DIAZO COLORS AND DYEING METHOD USING THE SAME

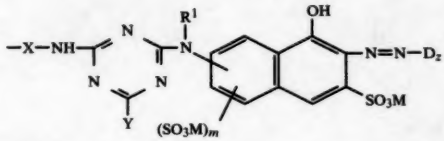
Yoshiaki Kato, Mitaka, and Toshio Hihara, Kitakyushu, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

Continuation of Ser. No. 866,135, May 21, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 186,656
Claims priority, application Japan, May 28, 1985, 60-113198
Int. Cl.[4] C09B *62/09, 65/513;* **D06P** *1/382, 1/384*
U.S. Cl. 534—634 **3 Claims**

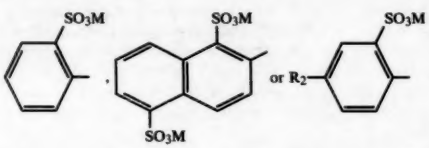
1. A disazo dyestuff represented by the formula:







wherein D_z represents



M represents hydrogen or alkali metal; R^1 represents hydrogen or lower alkyl; R^2 represents lower alkyl or lower alkoxy; A represents phenylene; X represents phenylene or phenylene substituted with methyl, methoxy, carboxy, sulfonic, or chlorine; Y represents halogen; and m represents 0 or 1.

4,841,030

AZO REACTIVE DYESTUFFS

Horst Jäger, Koeln-Buchheim, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

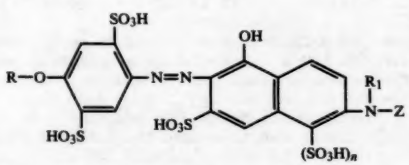
Continuation of Ser. No. 166,436, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 6,023, Jan. 24, 1979, which is a continuation of Ser. No. 299,659, Oct. 24, 1979, abandoned, which is a continuation of Ser. No. 881,925, Dec. 3, 1969, abandoned. This application Dec. 4, 1981, Ser. No. 327,337

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1968, 1813438

Int. Cl.[4] C09B *62/085, 62/09, 62/245, 62/405*

U.S. Cl. 534—638 **3 Claims**

1. A reactive dyestuff of the formula



wherein

R is alkyl of 1–5 carbon atoms or cyclohexyl;

R_1 is hydrogen;

Z is monochlorotriazinyl further substituted by amino C_1–C_3-alkylamino, hydroxyethylamine, di-hydroxethylamino, morpholine, piperidino, cyclohexylamino, phenylamino, carboxy- or sulpho-phenylamino, methoxy, ethoxy, phenylsulphonyl-methoxy, phenoxy, sulphophenyloxy, methyl- or methoxy-phenyloxy, hydroxyethylmercapto, phenylmercapto, methyl-phenylmercapto, dinitrophenylmercapto, methyl or phenyl; and

n is 0 to 1.

4,841,031

REACTIVE DYE HAVING BOTH MONOCHLOROTRIAZINYL AND VINYLSULFONE TYPE REACTIVE GROUPS

Yutaka Kayane, Sakai; Katsumasa Otake, Nara, and Yasuo Tezuka, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

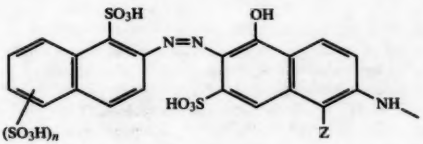
Filed Sep. 7, 1984, Ser. No. 648,349

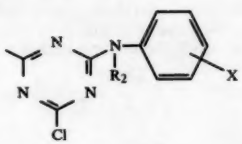
Claims priority, application Japan, May 6, 1981, 56-68727; May 6, 1981, 56-68728

Int. Cl.[4] C09B *62/085, 62/45, 62/53;* **D06P** *1/38*

U.S. Cl. 534—638 **6 Claims**

1. A compound represented by a free acid of the formula,





wherein R_2 is alkyl having 1 to 4 carbons and is unsubstituted; Z is hydrogen or sulfonic acid; n is 0 or 1; and X is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Y$ in which Y is a group that is splittable by alkalis.

4,841,032

FIBER REACTIVE MONOAZO COMPOUNDS HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS IN THE MOLECULE

Toshihiko Morimitsu; Sadanobu Kikkawa, both of Minoo; Naoki Harada, Suita, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

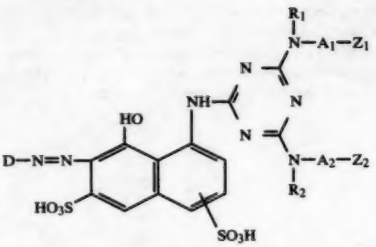
Filed Aug. 28, 1987, Ser. No. 90,508

Claims priority, application Japan, Sep. 19, 1986, 61-223453; Nov. 18, 1986, 61-274868

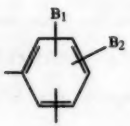
Int. Cl.[4] C09B *62/51;* **D06P** *1/384, 3/66*

U.S. Cl. 534—642 **8 Claims**

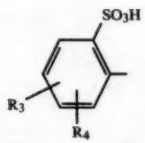
1. A compound represented by the following formula in a free acid form,



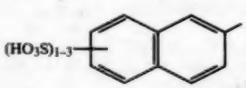
wherein A_1 and A_2 independently of one another are a phenylene group represented by the following formula,



wherein B_1 and B_2 independently of one another are hydrogen, methyl, ethyl, methoxy, ethoxy, halogeno or sulfo, or a naphthylene group unsubstituted or substituted with one sulfo, Z_1 and Z_2 independently of one another are $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Y$ in which Y is a group capable of being split by the action of an alkali, R_1 and R_2 independently of one another are hydrogen or alkyl having 1 to 4 carbon atoms, which is unsubstituted or substituted with hydroxy, cyano, alkoxy, halogeno, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, and D is a sulfophenyl of the formula



in which R_3 and R_4 independently of one another are hydrogen, methyl, ethyl, methoxy, ethoxy, chloro, bromo, acetylamino, propionylamino, nitro, sulfo or carboxy, or a sulfonaphthyl of the formula,



provided that $-A_1-Z_1$ and $-A_2-Z_2$ are different from each other when D is the sulfophenyl and both R_1 and R_2 are hydrogen.

4,841,033

REACTIVE RED MONOAZO DYE COMPOUND HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS

Toshihiko Morimitsu; Sadanobu Kikkawa, both of Minoo; Naoki Harada, Suita, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

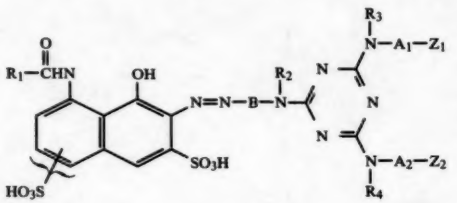
Filed Sep. 29, 1987, Ser. No. 102,355

Claims priority, application Japan, Oct. 29, 1986, 61-257841; Dec. 9, 1986, 61-294513

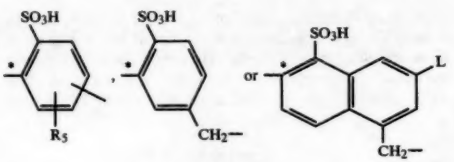
Int. Cl.[4] C09B *62/51;* **D06P** *1/384, 3/66*

U.S. Cl. 534—642 **7 Claims**

1. A monoazo compound represented by the following formula in a free acid form,



wherein R_1 is C_{1-4} alkyl, β-carboxyethyl, β-carboxyvinyl or phenyl unsubstituted or substituted with C_{1-4} alkyl, nitro, sulfo, or halogeno, R_2, R_3 and R_4 independently of one another are each hydrogen or alkyl, unsubstituted or substituted with hydroxy, cyano, C_1–C_4 alkoxy, halogeno, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl, A_1 and A_2 independently of one another are each an unsubstituted or substituted phenylene or naphthylene group, B is



in which R_5 is hydrogen, methyl or sulfo, L is hydrogen or sulfo, and the asterisked linkage is bonded to the azo group, and Z_1 and Z_2 independently of one another are each $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Y$ in which Y is a group splittable by the action of an alkali.

4,841,034

WATER-SOLUBLE AZO COMPOUNDS HAVING A TRIAZINE MOIETY AND DYEING METHOD THEREWITH

Satoshi Ototake, Ohmiya; Ryozo Matsunaga, and Masao Furusawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

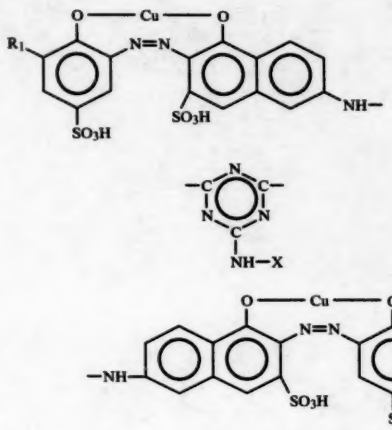
Continuation of Ser. No. 443,674, Nov. 22, 1982, abandoned. This application Nov. 15, 1984, Ser. No. 671,036

Claims priority, application Japan, Dec. 3, 1981, 56-193629

Int. Cl.[4] C09B *45/08, 45/28, 45/01;* **D06P** *1/10*

U.S. Cl. 534—701 **6 Claims**

1. A water-soluble azo compound which, in the free acid form, is represented by the following formula:



wherein R_1 and R_2 stand independently for chlorine or nitro, and X stands for phenyl which may be substituted with chlorine, methyl, lower-alkoxy or carboxyl.

6. A method for dyeing cellulose fibers which comprises dyeing said fibers with the water-soluble azo compound of claim 1.

4,841,035

CERTAIN-2-PYRIDYLOXY-PHENOXY-PROPIONIC ACID-S-THIAZOLIN-2-YL AND BENZOTHIAZOL-2-YL ESTER DERIVATIVES

Shinzo Someya, Tokorozawa; Seigo Koura, Tokyo; Mikio Ito, Tokuyama; Akira Nakanishi, Yokohama, and Yuji Nonaka, Tokuyama, all of Japan, assignors to Toyo Soda Mfg. Co. and Agro-Kanesho Co., Ltd., both of Tokyo, Japan

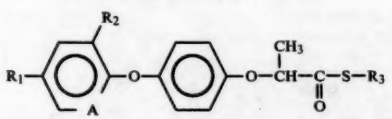
Division of Ser. No. 48,956, May 12, 1987, Pat. No. 4,741,756. This application Nov. 2, 1987, Ser. No. 116,241

Claims priority, application Japan, May 16, 1986, 61-111929

Int. Cl.[4] C07D *401/12, 277/70*

U.S. Cl. 546—270 **1 Claim**

1. A propionic acid thiol ester derivative having the formula:



wherein

R_1 is a cyano group, a trifluoromethyl group, a halogen atom or a nitro group, R_2 is a hydrogen atom, a halogen atom or a cyano group, R_3 is a thiazolin-2-yl group or a benzothiazol-2-yl group, and A is a nitrogen atom.

4,841,036

PHENYL ACOTHIENYLTHIAZOANILINE DIS-AZO DYE FOR POLYESTER FIBERS

Seiichi Imahori; Kiyoshi Himeno, and Junji Yoshihara, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

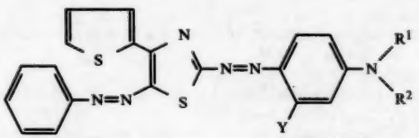
Continuation of Ser. No. 372,264, Apr. 26, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 683,323

Claims priority, application Japan, Apr. 24, 1981, 56-62070

Int. Cl.[4] C09B *31/043, 29/36, 33/02, 35/02*

U.S. Cl. 534—761 **1 Claim**

1. A dis-azo dye for polyester fibers represented by the formula



wherein Y is hydrogen or acetylamino, and R^1 and R^2 are each C_1–C_4 alkyl, cyanoethyl, acetoxyethyl or C_1–C_4 alkoxyethyl.

4,841,037

AMINO SULFONAPHTHOLTRISAZO COMPOUNDS AND RECORDING LIQUIDS CONTAINING THE SAME

Tokuya Ohta; Masatsune Kobayashi; Yuko Suga; Konoe Miura; Hiroshi Takimoto, all of Yokohama, and Tomio Yoneyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha and Mitsubishi Chemical Industries Limited, both of Tokyo, Japan

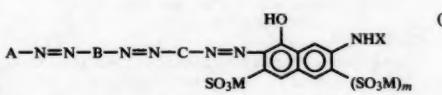
Filed Jun. 10, 1986, Ser. No. 872,605

Claims priority, application Japan, Jun. 11, 1985, 61-126987; Jun. 11, 1985, 61-126988; Jun. 11, 1985, 61-126990; Jun. 11, 1985, 61-126991

Int. Cl.[4] C09B *31/27, 33/22;* **C09D** *11/16*

U.S. Cl. 534—815 **17 Claims**

1. A naphthalene trisazo compound represented by the formula (II):



(II)

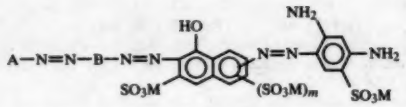
wherein X represents hydrogen, lower alkyl, phenyl, or phenyl substituted with —SO_3M;

m is zero or 1;

M represents alkali metal, ammonium or H.Am (wherein Am represents amine); and

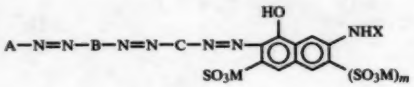
A represents an unsubstituted or substituted benzene or naphthalene ring, B and C each represent an unsubstituted or substituted 1,4-phenylene or 1,4-naphthalene provided that B and C do not represent a naphthalene ring at the same time; that the substituents for each of A, B and C in formula (II) are one or more substituents selected from the group consisting of —SO_3M, lower alkyl, lower alkoxy, lower alkyl carbonylamino, —COOM, and halogen; and that none of A, B and C contain a hydroxy or an unsubstituted amino group.

8. A recording liquid comprising a recording agent as a recording-image forming component and a liquid medium for dissolving or dispersing said recording agent, wherein said recording agent comprises at least one napthalene trisazo compound selected from the group consisting of compounds represented by the formula (I) or (II):



(I)

or



(II)

wherein

X represents hydrogen, lower alkyl, phenyl or phenyl substituted with $-SO_3M$;

m is zero or 1;

M represents an alkali metal, ammonium or H.Am (wherein Am represents amine); and

wherein in formula (I), A is a $-SO_3M$ substituted naphthyl group, and B is phenyl substituted by at least one substituent selected from the group consisting of lower alkyl and lower alkoxy, and in formula (II), A represents an unsubstituted or substituted benzene or naphthalene ring; B and C each represent an unsubstituted or substituted 1,4-phenylene or 1,4-naphthalene provided that B and C do not represent a naphthalene ring at the same time; that the substituents for each of A, B and C in formula (II) are one or more substituents selected from the group consisting of $-SO_3M$, lower alkyl, lower alkoxy, lower alkyl carbonylamino, —COOM, and halogen; and that none of A, B and C contain a hydroxy or an unsubstituted amino group.

4,841,038

METHOD FOR PREPARING COENZYME A ESTERS OF ALL-TRANS- AND 13-CIS RETINOIC ACIDS

Hector F. DeLuca, Madison, Wis.; Andrzej Kutner, Warsaw, Poland, and Heinrich K. Schnoes, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 869,791, Jun. 2, 1986, Pat. No. 4,757,140. This application May 5, 1988, Ser. No. 190,443

Int. Cl.[4] C07H *19/20*

U.S. Cl. 536—27 **1 Claim**

1. A method for preparing all-trans and 13-cis-retinoyl CoA which comprises treating, respectively, all-trans or 13-cis-retinoic acid with N-hydroxysuccinimide, separating formed dicyclohexylurea from the reaction mixture, recovering the respective N-succinimidyl esters of all-trans or 13-cis-retinoic acid, reacting said respective esters with a solution of Coenzyme A and recovering all-trans-retinoyl CoA or 13-cis-retinoyl CoA.

4,841,039

2',3'-DIDEOXY-5-SUBSTITUTED URIDINES AND RELATED COMPOUNDS AS ANTIVIRAL AGENTS

Chung K. Chu, Athens, and Raymond F. Schinazi, Tucker, both of Ga., assignors to Emory University, Atlanta and University of Georgia Research Foundation, Inc., Athens, both of, Ga.

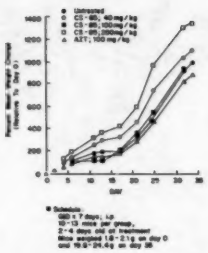
Continuation of Ser. No. 857,947, May 1, 1986, Pat. No. 4,681,933. This application Feb. 18, 1987, Ser. No. 16,136

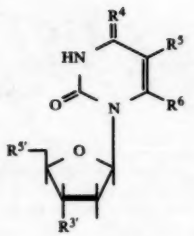
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] C07H *19/073, 19/10*

U.S. Cl. 536—29 **2 Claims**

1. A compound which exhibits antiviral activity having the formula:





wherein R^4 is O; R^5 is ethyl; $R^{3'}$ is N_3; $R^{5'}$ is OH, N_3, NH_2, phosphate, or a C_{1-4} acyl group; and R^6 is H.

4,841,040

PHOSPHATED, OXIDIZED STARCH AND USE OF SAME AS DISPERSANT IN AQUEOUS SOLUTIONS AND COATING FOR LITHOGRAPHY

Ernst K. Just, and Robert G. Nickol, both of Wilmington, Del., assignors to Aqualon Company, Wilmington, Del.

Filed Dec. 9, 1987, Ser. No. 131,053

Int. Cl.[4] C08B *31/06*

U.S. Cl. 536—105 **10 Claims**

1. A phosphated, oxidized starch having a molecular weight of about 1,500 to about 40,000 Daltons, a carboxyl degree of substitution of 0.30 to 0.96, and a phosphate degree of substitution of about 0.002 to about 0.005.

4,841,041

PENTASACCHARIDES AND TETRASACCHARIDES HAVING ANTI-THROMBOTIC ACTIVITY

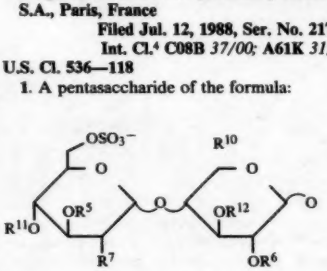
Constant A. A. van Boeckel, Mercuriusstraat; Tom Beetz, Lith, both of Netherlands, and Maurice Petitou, Paris, France, assignors to Akzo N.V., Arnhem, Netherlands and Sanofi S.A., Paris, France

Filed Jul. 12, 1988, Ser. No. 217,997

Int. Cl.[4] C08B *37/00;* **A61K** *31/715*

U.S. Cl. 536—118 **10 Claims**

1. A pentasaccharide of the formula:



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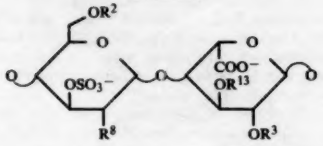
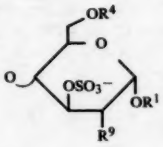




wherein:

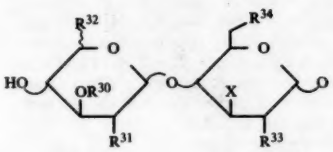
R^1 is hydrogen or alkyl (1–20 C),

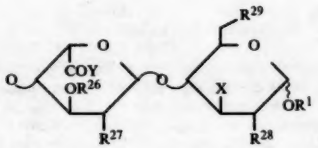
R^2, R^3, R^4, R^5, R^6, R^{11}, R^{12} and R^{13} represent hydrogen or the moiety SO_3^-,

R^7, R^8, R^9 represent OH, OSO_3^-, $NHSO_3^-$ or NH-acyl,

R^{10} represents the moiety COO^-, CH_2OH or $CH_2OSO_3^-$ and the charge of the various charged moieties is compensated by suitable pharmaceutically acceptable counter-ions.

10. A tetrasaccharide of the formula:





or a salt thereof, wherein

R^1 is H or a 1–2 C alkyl;

R^{26}, R^{27}, R^{29}, R^{30}, R^{31} and R^{34} represent a moiety selected from X and OBzl;

X represents an O-acyl moiety wherein the acyl can be removed by hydrolysis;

Bzl represents a protecting group that can be removed by hydrogenolysis;

R^{28} and R^{33} represent a moiety selected from X, OBzl, N_3, NH-acyl and NHBzl;

R^{32} represents a moiety selected from —COY, CH_2X and CH_2OBzl; and

Y represents an OALK, wherein ALK is a hydrocarbon radical.

4,841,042

PROCESS FOR THE PREPARATION OF CARBAPENEM INTERMEDIATES

Dieter Häbich, and Wolfgang Hartwig, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

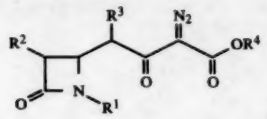
Filed Mar. 10, 1986, Ser. No. 838,237

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509769

Int. Cl.[4] **C07D** *205/08, 401/06;* **C07F** *7/18;* **C07B** *37/04*

U.S. Cl. 540—200 **4 Claims**

1. A compound of the formula



in which

R^1 represents hydrogen or represents an amino protective group,

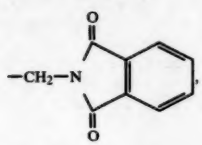
R^2 represents hydrogen, represents halogen, represents azido or phenyl, represents NHR^1, represents a radical of the formula

represents straight-chain, branched or cyclic, saturated or unsaturated alkyl (up to C_6), which is optionally substituted by fluorine, chlorine or the group O—R^8,

X denoting sulphur or oxygen,

R^8 representing hydrogen, representing trimethylsilyl, triethylsilyl, triisopropylsilyl, tert.butyldimethylsilyl, triphenylsilyl, trimethylsilylethoxycarbonyl, representing benzyl, benzyloxycarbonyl, 2- or 4-nitrobenzyl, 2- or 4-nitrobenzyloxycarbonyl, tert.-butyloxycarbonyl, allyloxycarbonyl, 4l-methoxybenzyl, 4-methoxybenzyloxycarbonyl, or representing formyl, acetyl, trichloroacetyl, trichloroethoxycarbonyl, 2,4-dimethoxybenzyloxycarbonyl, methoxymethyl, methylthiomethyl, methoxyethoxymethyl, [20(trimethylsilyl)ethoxy]methyl, 2-methylthiomethoxy)ethoxycarbonyl, tetrahydropyranyl or benzoyl,

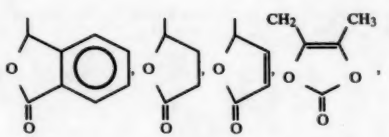
R^3 represents 3,4-dimethoxyphenyl, represents chlorine, bromine, cyano, cyanato, azido, CF_3, represents -COR^{18}, -$CONR^{19}R^{18}$, allyloxycarbonyl, 4-nitrobenzyloxycarbonyl, —NHR^{18}, ureido, guanidino, amidino, —$NHSO_2R^{20}$, —OSO_2R^{20}, —$OPO(OR^{19})$ OR^{18}, —S—R^{18}, —$SCOR^{18}$, —SO_2OR^{18}, —SO_2NHR^{18}, —SCN, —SO_2R^{20}, —$SCONH_2$ -S-pyridyl, -S-pyrimidyl, -S-methyltetrazolyl, -S-thiadiazolyl, 2-aminothiadiazolyl or



R^{18} and R^{19} being identical or different and representing hydrogen, representing straight-chain or branched alkyl (up to C_6), representing phenyl, 4-methylphenyl or benzyl, or representing a protective group for hydroxyl, mercapto or amino, and

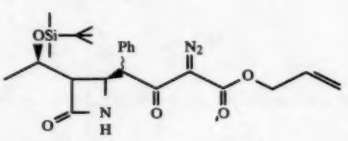
R^{20} having the same meaning as R^{19} and R^{18} but not representing hydrogen or a protective group, and

R^4 represents hydrogen or represents methyl, ethyl, tert.-butyl, decyl, 2-chloroethyl, 2,2,2-trichloroethyl, cyanoethyl, diphenylmethyl or triphenylmethyl, acetonyl, allyl, benzyl, 4-methoxybenzyl, 2,4-dimethoxybenzyl, tert.-butyldimethylsilyl, 1-phenoxyethyl or 2-methyl-2-propenyl, 4-nitrobenzyl, 2-nitrobenzyl, trimethylsilylethyl or dimethyl-tert.-butylsilylethyl or represents a radical of the formula



—CH_2—OCO—$C(CH_3)_3$, —$CH(CH_3)OCOOC_2H_5$ or —CH_2OCOCH_3.

3. The compound 3-(tert.butyldimethylsilyloxyethyl)-4-(3-allyloxycarbonyl-)-3-diazo-2-oxo-1-phenylpropyl)-azetidin-2-one of the formula



4,841,043

STEREOSELECTIVE SYNTHESIS OF 1-β-ALKYL CARBAPENEM ANTIBIOTIC INTERMEDIATES

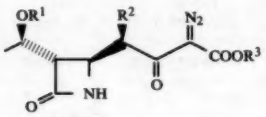
Robert Deziel, St. Lambert, and Masaki Endo, Candiac, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 812,570, Dec. 23, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,054

Int. Cl.[4] C07D *205/08;* **C07B** *37/04;* **C07F** *7/22, 7/18*

U.S. Cl. 540—200 **34 Claims**

1. A process for producing diazo intermediates of the formula



14

wherein

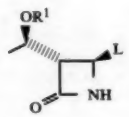
R^1 is hydrogen or a conventional hydroxy-protecting group;

R^2 is a lower alkyl having from 1–6 carbon atoms, and

R^3 represents a conventional carboxyl-protecting group,

which process comprises

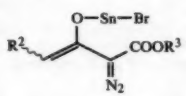
reacting a compound, in the presence of tin, a silver salt, iodine, or an iodide salt as catalysit and a polar solvent, said compound having the formula



10

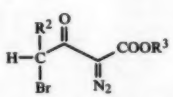
wherein R^1 is as defined above, and

L is a leaving group capable of being displaced by a tin enolate of the formula



11

wherein R^2 and R^3 are as defined above, with a compound of the formula



36

wherein R^2 and R^3 are as defined above.

4,841,044

CEPHALOSPORIN DERIVATIVES

Yoshiaki Watanabe, Kodaira; Chihiro Yokoo, Gyoda; Masami Goi, Kisai; Akira Onodera, Kuki; Mitsuo Murata, Washimiya; Hiroshi Fukushima, Miyashiro; Minoru Taguchi, Ohmiya, and Kaoru Sota, Shimotomi, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

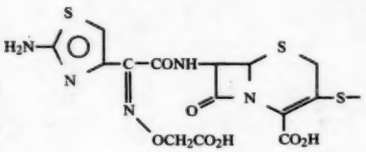
Filed Dec. 18, 1986, Ser. No. 943,037

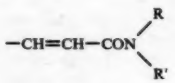
Claims priority, application Japan, Dec. 23, 1985, 60-289589; Mar. 15, 1986, 61-56084; Jun. 25, 1986, 61-148668

Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

U.S. Cl. 540—227 **5 Claims**

1. A cephalosporin derivatives represented by the formula





wherein R is a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms, R′ is a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms or a benzyl group, or R and R′ together with the nitrogen atom to which they are attached form a tetrahydropyridinyl group, a morpholinyl group or pyrroridinyl group, and the non-toxic salts thereof.

4,841,045

SYNTHESIS OF VINBLASTINE AND VINCRISTINE TYPE COMPOUNDS

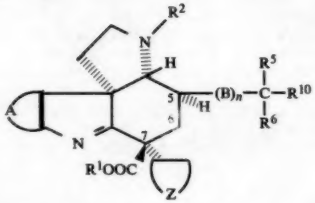
Martin Kuehne, Burlington, Vt., assignor to University of Vermont & State Agricultural College, Burlington, Vt.

Continuation-in-part of Ser. No. 810,112, Dec. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 710,792, Mar. 12, 1985, abandoned. This application May 18, 1987, Ser. No. 50,807

Int. Cl.[4] C07D *519/04, 461/00, 487/04*

U.S. Cl. 540—478 **48 Claims**

1. A process for producing a compound of the formula:

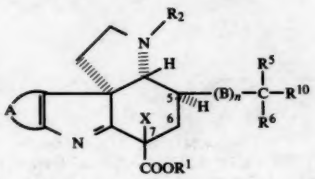


III

wherein n is an integer from 0 to 1; Z is the remaining portion of a ring selected from the group consisting of vindoline, 16-lower alkoxy vindoline, des(N-methyl)-N-formyl vindoline, des(N-methyl)-N-formyl-16-lower alkoxy vindoline and 16-methoxy-2,3-dihydro N^a methyl-tabersonine; R^1 is lower alkyl; R^2 is an amino protecting group; R^{10} is $—CH_2Y$, formyl or formyl protected through the formation of an acetal; A is the remaining portion of a benzene ring; B is an alkylene chain of 1 to 4 carbon atoms; Y is individually a leaving group or a hydrolyzable ether group, R^5 is hydrogen or lower alkyl, R^6 is individu-

ally hydrogen, lower alkyl, or taken together with Y forms a lower alkylidenedioxy or oxo

or mixtures thereof with the corresponding 7R-diastereomer having the configuration at C-5 opposite to that shown above, comprising condensing a compound of the formula



II

wherein n, R^1, R^2, R^5, R^6, A, R^{10} and B are as above and X is halogen with the proviso that when R^6 is a hydrolyzable ether group, R^{10} is $—CH_2Y$, Y is a leaving group;

with vindoline, 16-lower alkoxy vindoline, des(N-methyl)-N-formyl vindoline, des(N-methyl)-N-formyl-16-lower alkoxy vindoline or 16-methoxy-2,3-dihydro N^a methyl-tabersonine or a salt thereof.

4,841,046

PROCESS FOR THE PREPARATION OF PYRIDOBENZODIAZEPINONE

Roberto P. Giani, Locate Triulzi; Ettore Parini, Cologno Monzese; Giancarlo Tonon, Milan, and Massimiliano Borsa, Vimodrone, all of Italy, assignors to Dompe' Farmaceutici S.p.A., Milan, Italy

Filed Oct. 26, 1988, Ser. No. 262,787

Claims priority, application Italy, Oct. 30, 1987, 48557 A/87

Int. Cl.[4] C07D *471/04*

U.S. Cl. 540—495 **2 Claims**

1. A process for the preparation of 6,11-dihydro-5H-pyrido [2,3-b][1,5]benzodiazepin-5-one by the condensation of 2-chloronicotinic acid and o-phenylenediamine, characterized in that the reaction of condensation is carried out at reflux in a solvent selected from the group consisting of cyclopentanol and cyclohexanol.

4,841,047

4-BENZYL-1-(2H)-PHTHALAZINONE-DERIVATES

Jürgen Engel, Alzenau, and Gerhard Scheffler, Hanau, both of Fed. Rep. of Germany, assignors to Aasta Pharma AG, Frankfurt, Fed. Rep. of Germany

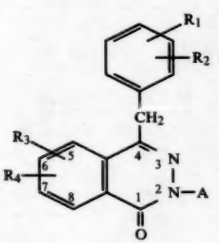
Filed Nov. 10, 1986, Ser. No. 928,458

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 3539873

Int. Cl.[4] A61K *31/50, 31/55;* C07D *403/04, 401/04*

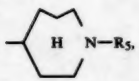
U.S. Cl. 540—599 **8 Claims**

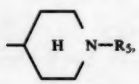
1. A 4-benzyl-1-(2H)-phthalazinone derivative of the formula

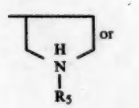


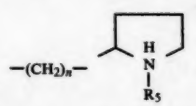
I

wherein R_1 represents fluorine, chlorine, bromine, trifluoromethyl, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, C_2–C_6-alkanoyloxy, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, C_2–C_6-alkanoylamino, C_2–C_6alkanoyl-C_1–C_6-alkylamino or a nitro group, R_2 represents hydrogen or has one of the meanings given above for R_1, and R_1 and R_2 may be the same or different, R_3 and R_4 may be the same or different and represent hydrogen, halogen, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, benzyloxy or C_2–C_6-alkanolyloxy and A represents one of the radicals









wherein n=1 or 2 and R_5 represents a C_1–C_6-alkyl group substituted by the following radicals:

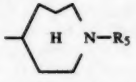
(a) a phenyl radical or a phenyl carbonyl radical each of which may contain one, two or three substituents, which may be the same or different, whereby the substituents are halogen atoms, trifluoromethyl, C_1–C_6-alkoxy groups, or

(b) a C_1–C_6-alkoxy radical, a mono or dihydroxy-C_1–C_6-alkyl radical or a hydroxy-C_1–C_6 alkoxy radical or

(c) a mono-C_1–C_6-alkylamino or di-C_1–C_6-alkylamino radical whereby the latter may also be closed to form a 5–7 membered, nitrogen-containing ring, which may optionally contain a further oxygen atom, or

(d) a C_3–C_8-cycloalkyl radical or a C_3–C_8-cycloalkylcarbonyl radical

or wherein R_5 is a monounsaturated C_3–C_6alkyl group, a monounsaturated C_3–C_6-alkyl group with a phenyl radical, a monounsaturated C_3–C_6-alkylcarbonyl group or a monounsaturated C_3–C_6alkylcarbonyl group with a phenyl radical and physiologically acceptable addition salts thereof, with the exception of compounds wherein A represents the radical



and R_5 represents allyl, benzyl, phenylethyl or methoxyethyl, R_1 represents chlorine in the 4-position and R_2, R_3 and R_4 represent hydrogen.

4,841,048

DIOXAZINE COMPOUND HAVING VINYLSULFONE TYPE FIBER REACTIVE GROUP

Hirokazu Sawamoto, Minoo; Takashi Omura, Ashiya, and Naoki Harada, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

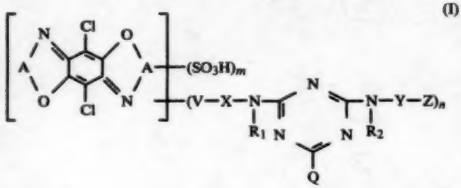
Continuation of Ser. No. 12,177, Feb. 9, 1987, abandoned. This application Nov. 19, 1987, Ser. No. 125,745

Claims priority, application Japan, Feb. 17, 1986, 61-32645

Int. Cl.[4] C07D *265/34*

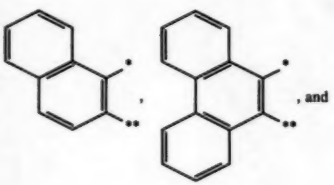
U.S. Cl. 544—74 **6 Claims**

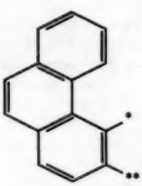
1. A dioxazine compound represented by the following formula (I) in a free acid form,



(I)

wherein A is an aromatic ring residue selected from the group consisting of:





in which * and ** denote linkages to the adjacent nitrogen and oxygen atoms, respectively, V is direct linkage, $—SO_2NR_5—$ or $—NR_6—$ in which R_5 and R_6 are independently hydrogen, alkyl unsubstituted or substituted by hydroxyl, cyano, alkoxy, halogen, carboxy, carbamoyl, alkoxy carbonyl, alkyl carbonyloxy, sulfo, or sulfamoyl, X is direct linkage or aliphatic, alicyclic, araliphatic or aromatic divalent group, Y is phenylene unsubstituted or substituted once or twice by methyl, ethyl, methoxy, chloro, bromo, or sulfo, or naphthylene unsubstituted or substituted once by sulfo, Z is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Z_1$ in which Z_1 is a group splittable by the action of an alkali, Q is sulfo, hydroxy, halogeno, lower alkoxy, phenoxy unsubstituted or substituted once or twice by methyl, ethyl, methoxy, chloro, bromo, sulfo or carboxy, or amino, alkylamino, cycloalkylamino, aralkylamino, arylamino, N,N-dialkylamino, N-alkyl-N-cycloalkylamino, N-alkyl-N-arylamino, heterocylic ring-containing amino or N-heterocylic ring-containing amino, R_1 is hydrogen, alkyl unsubstituted or substituted by hydroxyl, cyano, alkoxy, halogen, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, or, when X is direct linkage and V is the $—SO_2NR_5—$, R_1 and R_5 may form a ring taken together with each adjacent nitrogen, R_2 is hydrogen, alkyl unsubstituted or substituted by hydroxyl, cyano, alkoxy, halogen, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, and m and n satisfy the following formula,

$$O<m+n\leqq 6$$

provided that m and n each is defined as follows,

$$O\leqq m\leqq 5 \text{ and } O<n\leqq 4.$$

4,841,049

REACTIVE DYES OF THE DIOXAZINE SERIES

Karl Seitz, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

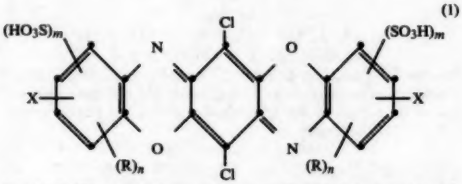
Filed Sep. 3, 1987, Ser. No. 92,798

Claims priority, application Switzerland, Sep. 12, 1986, 3666/86

Int. Cl.[4] C07D *265/38*; C09B *19/02*

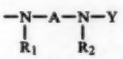
U.S. Cl. 544—76 **15 Claims**

1. A reactive dye of the formula



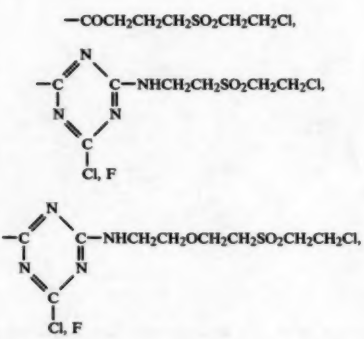
(I)

in which $(R)_n$ stands for n substituents R which, independently each other, are C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, carboxyl, carbamoyl, N-C_{1-4}-alkylcarbamoyl, N,N-di-C_{1-4}-alkylcarbamoyl, C_{1-4}-alkylsulfonyl, sulfamoyl, N-C_{1-4}-alkylsulfamoyl or N,N-di-C_{1-4}-alkylsulfamoyl, n is 0 to 2, m is 1 to 2, one X is an H_2N group and the other X is a radical of the formula



(2)

in which R_1 and R_2 are independently of each other hydrogen or C_{1-4}-alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano, sulfo or sulfato, A is C_{2-4}-alkylene which is unsubstituted or substituted by halogen, hydroxyl, carboxyl, sulfo, phenyl, sulfophenyl or C_{1-4}-alkoxycarbonyl, or is cyclohexylene which unsubstituted or substituted by C_{1-4}alkyl, or in which the group $—N(R_1)—A—N(R_2)—$ is 1,4-piperazinediyl, and Y is a radical of the formula



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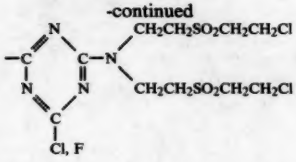

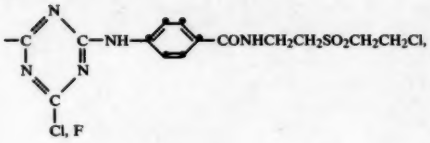

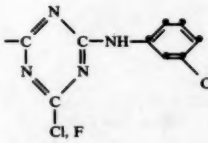

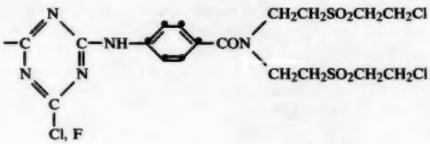

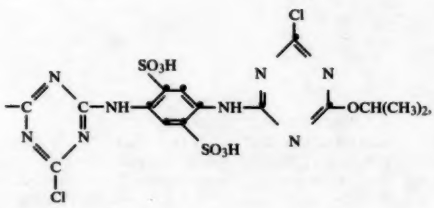

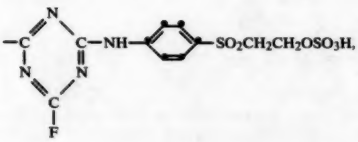

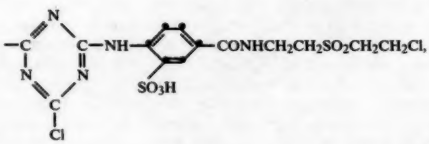

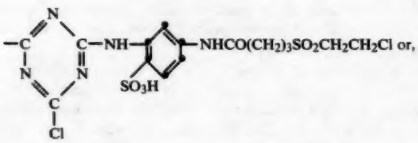

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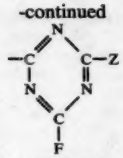


wherein Z is methoxy, isopropoxy, —NH_2, and N-C_1–C_6-alkylamino, N,N-di-C_1–C_6-alkylamino, cyclohexylamino, benzylamino, phenethylamino, phenylamino, naphthylamino, N-C_1–C_6-alkyl-N-cyclohexylamino, N-C_1–C_6-alkyl-N-phenylamino, furanylamino. thiophenylamino, pyrazolylamino, pyridylamino, pyrimidinylamino, quinonylamino, benzimidazolylamino, benxthiazolylamino or benzoxazolylamino radical or the radical of a 6-membered N-heterocyclic compound which can contain nitrogen, oxygen and sulfur as further heteroatoms, all of which radicals mentioned above are unsubstituted or substituted by halogen, nitro, cyano, trifluoromethyl. sulfamoyl, carbamoyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, acetylamino, ureido, hydroxyl, carboxyl, sulfomethyl or sulfo, or Y is a chlorotriazine radical which is substituted by —NH_2, β-sulfatoethylamino, β-hydroxyethylamino, N,N,di-β-hydroxyethylamino, phenylamino, N-ethyl-N-phenylamino, m-sulfophenylamino, p-sulfophenylamino, 2,5-disulfophenylamino, morpholino, methoxy or isopropoxy, or is a 2,4-difluoropyrimid-6-yl or 2,4-difluoro-5-chloro-pyrimid-6-yl radical.

4,841,050

CARBAZOLE CONTAINING BENZOPYRANS

Andreas Guentner; Udo Mayer, both of Frankenthal, and Andreas Oberlinner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

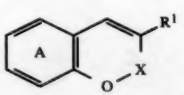
Filed Mar. 12, 1987, Ser. No. 25,063

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608215

Int. Cl.[4] C07D *405/06, 413/14*

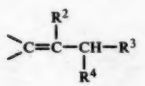
U.S. Cl. 544—150 **1 Claim**

1. A benzopyran of the formula I



(I)

where R^1 is unsubstituted C_1–C_8-alkyl, unsubstituted or substituted phenyl, C_1–C_5-alkoxy or halogen, X is a radical



R^2 is hydrogen or, together with R^1, is C_2—R^3 is carbazol-3-yl or 1,2,3,4,4a,9a-hexahydrocarbazol-6-yl, each of which may be substituted on the nitrogen atom by C_1–C_5-alkyl or benzyl, and the ring A may be fused to a benzo ring, may be substituted by C_1–C_4-alkyl, chlorine or bromine, or may be substituted in ring position 7 by C_1–C_5-mono- or dialkylamino (each of which in turn may be substituted by chlorine or phenyl), pyrrolidino, piperidino, morpholino, hydroxyl or C_1–C_4-alkoxy.

4,841,051

PHENYLPIPERAZINE DERIVATIVES

Akira Shiozawa, Saitama; Yuh-Ichiro Ichikawa, Tokyo, and Takashi Takahira, Saitama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

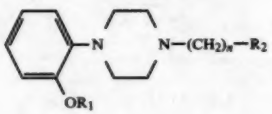
Filed Dec. 1, 1986, Ser. No. 936,270

Claims priority, application Japan, Dec. 10, 1985, 60-277412

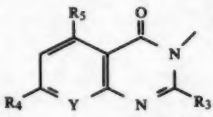
Int. Cl.[4] C07D *403/06*

U.S. Cl. 544—287 **3 Claims**

1. A phenylpiperazine derivative represented by the formula:



wherein R_1 stands for an ethyl group; R_2 stands for a group represented by the formula:



(wherein R_3, R_4 and R_5 each stand for a hydrogen atom or a methyl group and Y stands for CH); and n stands for an integer of 2 or 4, and pharmaceutically acceptable acid solution salts thereof.

4,841,052

NAPHTHALIC ACID IMIDES ELECTROPHOTOGRAPHIC TONERS

Horst Harnisch, Much, and Roderich Raue, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

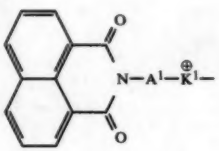
Division of Ser. No. 10,364, Feb. 3, 1987. This application Jul. 28, 1988, Ser. No. 225,329

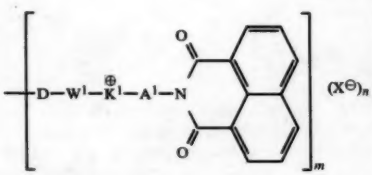
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604827

Int. Cl.[4] C07D *471/06*

U.S. Cl. 544—361 **1 Claim**

1. A naphthalic acid imide of the formula

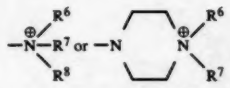




in which

A^1 represents C_2–C_5-alkylene,

$\oplus K^1$ represents



R^6 represents C_1–C_{16}-alkyl, carbamoylmethyl or benzyl,

R^7 represents methyl or ethyl or a single bond linked to D,

R^8 represents methyl or ethyl,

W^1 represents

Z^1 represents $—CH_2—$,

—O— or $—SO_2—$ and

$X^{\ominus}$ represents an unsubstituted benzosulphonate or a benzenesulphonate substituted by chlorinr or C_1–C_{12}-alkyl, a C_5–C_{18}-alkylsulphonate or a salt of a C_5–C_{18}-alkylcarboxylic acid or a salt of a condensation product of formaldehyde and arylsulphonic acids and/or optionally sulphonated 4,4'-dihydroxy-diphenylsulphone, wherein D represents $—CH_2—$, $—CH_2—CO—$, $—CH_2—CO—NH—$or $—CH_2—CO—NH—CH_2—$

m represent 0 or 1.

4,841,053

PROCESS FOR DESENSITIZING A 1-(ALKYLAMINO)ALKYL-POLYSUBSTITUTED PIPERAZINONE DURING RECOVERY

Pyong-Nae Son, Akron; Charles P. Jacobs, Elyria; Ronald M. Kovach, Avon Lake, and John T. Lai, Broadview Heights, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 848,555, Apr. 7, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 146,532

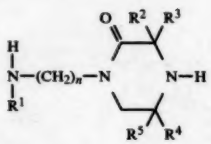
Int. Cl.[4] C07D *241/08*

U.S. Cl. 544—384 **5 Claims**

1. In a process for preparing a polysubstituted piperazinone reaction product from a triamine which is an acyclic or cyclic N-substituted-1,2-diamine or 1,3-diamine, comprising, contacting said triamine with a saturated acyclic or cyclic monoketone present in an amount from about 2 to about 25 times greater than the molar amount required to react with said triamine, in the absence of a phase transfer catalyst and a primary alcohol solvent, and in the presence of an alkali metal hydroxide and sufficient haloform to produce said reaction product at a reaction temperature in the rnage from above the freezing point of the reaction mass, up to about the reflux temperature thereof, and recovering said polysubstituted piperzinone, the improvement consisting essentially of

(i) adding a large excess of solid alkali metal hydroxide, at least five moles for each mole of said triamine,

(ii) producing a substantially completely monoketonesoluble water-sensitive polysubstituted piperazin-2-one represented by the structure



wherein, n represents 2 or 3, being the number of methylene groups linking the terminal amino group to the N^1 atom of the piperazinone,

R^1 represents C_1–C_{12} alkyl, C_5–C_{12} cycloalkyl, phenyl, naphthyl, alkylphenyl and alkyl-napahthyl each alkyl substituent being C_1–C_{12}, and,

R^2, R^3, R^4, and R^5 each represent C_1–C_{12} alkyl, C_1–C_8 hydroxylaklyl, C_1–C_8 aminoalkyl, C_1–C_8 alkoxylakyl, and, C_5–C_{12} cycloalkyl, and in combination, R^2 with R^3, and R^4 with R^5, represent C_5–C_{14} cycloalkyl having at least four of the C atoms cyclized;

(iii) separating an essentially anhydrous solution of said polysubstituted piperazinone in said monoketone substantially free of a salt of said alkali metal, without contacting said solution with water; and,

(iv) distilling unwanted low-boiling byproducts and said ketone from said solution to purify said polysubstituted piperazinone without degrading it.

4,841,054

2,6-DIMETHYL-3,5-DIMETHOXYCARBONYL-4-(5'-TRIMETHYLSILYL-2'-FURYL)-1,4-DIHYDROPYRIDINE

Edmund Y. Lukevits, ulitsa Ierikju,43,kv.10; Valeria V. Kastron, ulitsa Avotu,33,kv.2; Rasma O. Vitolin, ulitsa Suvorova,117,kv.13; Nikolai P. Erchak, ulitsa Dzirnavu,161,kv.13; Indulis P. Skrastinsh, ulitsa Lienes,9,kv.26; Gunar Y. Dubur, ulitsa Ierikju,43,kv.2, and Agris A. Kimenis, ulitsa Staitseles,15,kv.208, all of Riga, U.S.S.R.

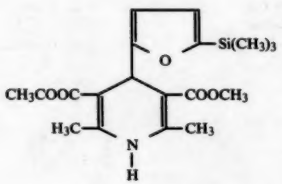
PCT No. PCT/SU86/00104, § 371 Date May 26, 1988, § 102(e) Date May 26, 1988, PCT Pub. No. WO88/03143, PCT Pub. Date May 5, 1988

PCT Filed Oct. 21, 1986, Ser. No. 239,953

Int. Cl.[4] C07F *7/10*

U.S. Cl. 546—14 **1 Claim**

1. 2,6-dimethyl-3,5-dimethoxycarbonyl-4-(5'-trimethylsilyl-2'-furyl)-1,4-dihydropyridine of the formula:



4,841,055

DESMOSINE DERIVATIVES AND REAGENT FOR PREPARING ARTIFICIAL ANTIGENS

Takashi Matsumoto, Stockholm, Sweden; Takashi Okada, and Sigenobu Mizusaki, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

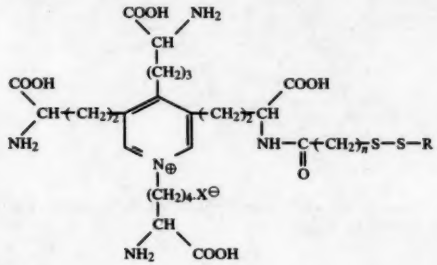
Division of Ser. No. 839,576, Mar. 14, 1986, Pat. No. 4,723,012. This application Jul. 30, 1987, Ser. No. 79,512

Claims priority, application Japan, Mar. 25, 1985, 57-58182

Int. Cl.[4] C07D *213/62, 213/32*

U.S. Cl. 546—261 **5 Claims**

1. A method for preparing a desmosine artificial antigen comprising the step of reacting a desmosine derivative having a formula:



where R is an electron-attracting organic group selected from the group consisting of pyridyl, azidophenyl and phenyl, X^- is an anion, and n is an integer of 1 to 6, with a carrier polymer having a thiol group derived from a material selected from the group consisting of bovine serum albumin, mouse gamma globulin, mouse serum albumin and keyhole limpet hemocyanin with a molar ratio of the desmosine derivative to carrier polymer being from about 10:1 to about 20:1 at a temperature and for a period of time sufficient for bonding said desmosine derivative to said carrier polymer through a disulfide bond, with the elimination of R-SH, to produce a desmosine artificial antigen.

4,841,056

SUBSTITUTED HEXAHYDRO-4H-INDOLO[6,5,4-CD]INDOLES

William H. Hunter, Amersham, England, assignor to Lilly Industries Limited, London, United Kingdom

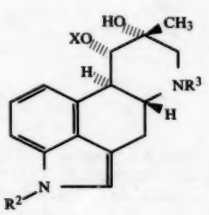
Filed Jan. 27, 1988, Ser. No. 148,807

Claims priority, application United Kingdom, Jul. 27, 1984, 8419278

Int. Cl.[4] C07D *457/14*

U.S. Cl. 546—68 **1 Claim**

1. A compound of formula:



in which R^2 is hydrogen, C_{1-4} alkyl or a protecting group, R^3 is C_{1-4} alkyl or a protecting group, and X is hydrogen or —OX is a leaving group.

4,841,057

CYCLIC IMIDO ANTHRAQUINONE COMPOUNDS

Konoe Miura, Yokohama; Tetsuo Ozawa, Hadano; Seigo Okumura, Machida, and Shinji Kubo, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

Filed Jan. 12, 1988, Ser. No. 143,366

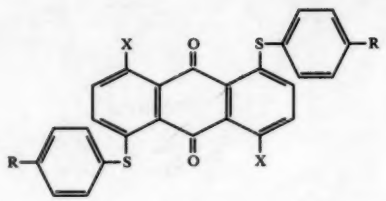
Claims priority, application Japan, Jan. 13, 1987, 62-5569; Feb. 10, 1987, 62-28696

Int. Cl.[4] C07D *221/02, 209/56, 209/02, 209/36*

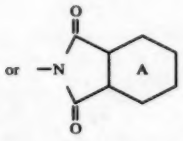
U.S. Cl. 546—183 **2 Claims**

1. An anthraquinone compound represented by formula:

(I)



wherein two R, which may be the same or different, each represents a hydrogen atom,



ring A represents a substituted or unsubstituted aromatic or aliphatic ring; and two X, which may be the same or different, each represents a hydrogen atom or an amino group, provided that X and R are not simultaneously a hydrogen atom.

4,841,058

VIOLOGEN DERIVATIVE

Takeshi Endo; Yoko Nambu, and Kazutoshi Yamamoto, all of Yokohama, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

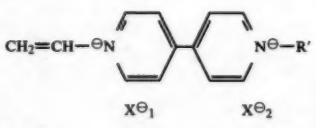
Continuation of Ser. No. 837,080, Mar. 6, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,626

Int. Cl.[4] C07D *401/04*

U.S. Cl. 546—257 **8 Claims**

1. A vinyl viologen derivative represented by the formula:

(I)



wherein

R′ is a hydrogen atom tolyl; benzyl a C_1–C_6 alkyl; a C_2–C_6 alkenyl; a C_3–C_6 cycloalkyl; a C_6–C_{10} unsubstituted aromatic group; substituted C_1–C_6 alkyl, substituted C_2–C_6 alkenyl or substituted C_6–C_{10} aromatic, wherein the substituent is —OH; and

X_1 and X_2 are anions which may be same or different.

4,841,059

PYRIDINE-ENAMINES

Michael Schriewer; Klaus Grohe, both of Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

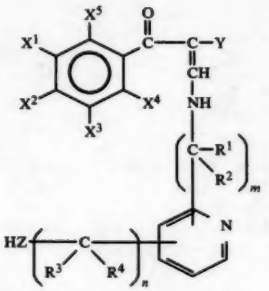
Division of Ser. No. 1,318, Jan. 8, 1987, Pat. No. 4,725,595. This application Oct. 15, 1987, Ser. No. 108,839

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600891

Int. Cl.[4] C07D *213/40, 213/63, 213/75*

U.S. Cl. 546—312 **2 Claims**

1. An enamine of the formula



in which

X^1 represents hydrogen, nitro, alkyl with 1–3 carbon atoms or halogen,

X^2 denotes halogen, alkyl with 1–3 carbon atoms, an alkylsulphonyl group with up to 3 C atoms in the alkyl radical or a phenylsulphonyl group,

R^5 can be hydrogen, halogen or methyl,

R^1, R^2, R^3 and R^4 each independently represents hydrogen, an alkyl group with 1–3 carbon atoms, phenyl, or a phenyl radical which is substituted by halogen, nitro, or alkyl with up to 3 carbon atoms,

Y represents a carboxyl group, a nitrile group, an ester group —$COOR^5$ or an acid amide group —$CONR^6R^7$,

Z represents oxygen or an amine radical NR^8,

m and n each denote 0 or 1,

X^3 represents halogen or the nitro group and

X^4 denotes halogen, a nitro group, an alkoxy, alkylmercapto or alkylsulphonyl group with in each case 1–3 carbon atoms or an arylsulphonyl group.

4,841,060

VAPOR-PHASE INTRAMOLECULAR DEHYDRATION REACTION OF ALKANOLAMINES

Youichi Hino, Sakai; Yuuji Shimasaki, Takatsuki, and Michio Ueshima, Takarazuka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 942,299, Dec. 16, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 183,474

Claims priority, application Japan, Dec. 23, 1985, 60-287924; Dec. 27, 1985, 60-292540

Int. Cl.[4] C07D *203/02, 295/02;* **B01J** *23/04, 23/02*

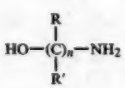
U.S. Cl. 546—184 **6 Claims**

1. A process for forming a cyclic amine represented by the general formula:

(II)

wherein each of R and R′ is hydrogen, a methyl group or an ethyl group, and n is an integer of 2 to 5, which comprises subjecting an alkanolamine represented by the general formula:

(I)



wherein R, R′ and n are as defined above, to vapor phase

intramolecular dehydration reaction in the presence of a catalytic oxide composition represented by the following formula:

$$Si_aX_xY_yO_b$$

wherein Si is silicon, X is at last one element selected from alkali metals and alkaline earth metals, Y is at least one element selected from B, Al, Ti, Zr, Sn, Zn and Ce, and O is oxygen; and the suffixes a, x, y and b represent the atomic ratios of the elements Si, X, Y and O respectively, and when a=1, x=0.005−1 and y=0−1, and b is a value determined by a, x and y.

4,841,061

PROCESS FOR PRODUCING CYCLIC AMINES

Yuuji Shimasaki, Takatsuki; Michio Ueshima, Takarazuka; Hideaki Tuneki, and Kimio Ariyoshi, both of Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

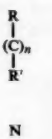
Continuation-in-part of Ser. No. 943,086, Dec. 18, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,351

Claims priority, application Japan, Dec. 27, 1985, 60-292541; Nov. 17, 1986, 61-271965; Nov. 17, 1986, 61-271966; Nov. 17, 1986, 61-271967; Nov. 17, 1986, 61-271968; Nov. 17, 1986, 61-271969; Nov. 17, 1986, 61-271970

Int. Cl.[4] C07D *203/02, 295/02;* **B01J** *27/18*

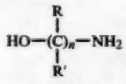
U.S. Cl. 546—184 **13 Claims**

1. A process for producing a cyclic amine represented by the general formula



(II)

wherein each of R and R′ is selected from hydrogen, a methyl group and an ethyl group, and n is an integer of 2 to 5, which comprises vapor-phase intramolecular dehydration reaction of an alkanolamine represented by the general formula



(I)

wherein R, R′ and n are as defined above, said reaction being carried out in the presence of, as a catalyst, an oxide composition represented by the following formula

$$X_aP_bY_cO_d$$

wherein X is at least one element selected from transition metal elements of Groups I through VIII, lanthanide elements, actinide elements and elements of Group IIIA in the periodic table, Si, Ge, Sn, Pb, Sb and Bi, P is phosphorus, Y is at least one element selected from alkali metal elements and alkaline earth metal elements, O is oxygen, the suffixes a, b, c and d are the atomic ratios of the elements X, P, Y and O, respectively, and when a=1, b=0.01−6, and c=0−3, and d is a value determined by a, b and c and the state of bonding of the constituent elements.

4,841,062

NEW CEPHEM AND CEPHAM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi; Kiyoshi Tsuji, both of Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

Division of Ser. No. 830,973, Feb. 19, 1986, which is a division of Ser. No. 543,247, Oct. 19, 1983, Pat. No. 4,604,456, which is a division of Ser. No. 886,340, Mar. 19, 1978, Pat. No. 4,425,341.

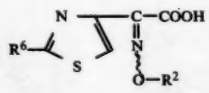
This application Feb. 11, 1988, Ser. No. 155,132

Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 7875

Int. Cl.[4] C07D *277/42, 277/46*

U.S. Cl. 548—194 **14 Claims**

1. A compound of the formula:



wherein

R^2 is cyclo(lower)alkyl or lower alkynyl having 2 to 6 carbon atoms, and

R^6 is amino or protected amino, or its reactive derivative at the carboxy group effective for transforming the carboxy group into a reactive N-acylating group.

4,841,063

2-ALKYL-3-HALOISOTHIAZOL-3-THIONE

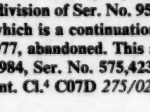
Joseph A. Virgilio; Milton Manowitz, both of Wayne, and Emanuel Heilweil, Fairfield, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 325,467, Nov. 27, 1981, abandoned, which is a division of Ser. No. 190,779, Sep. 25, 1980, Pat. No. 4,328,347, which is a division of Ser. No. 952,038, Oct. 16, 1978, Pat. No. 4,281,136, which is a continuation-in-part of Ser. No. 852,456, Nov. 25, 1977, abandoned. This application Jan. 31, 1984, Ser. No. 575,423

Int. Cl.[4] C07D *275/02*

U.S. Cl. 548—213 **7 Claims**

1. A 4-isothiazolin-3-thione of the formula:



wherein:

R is selected from the group of alkyl radicals having one to eight carbon atoms or is an allyl group;

Y and Z are selected from the group consisting of hydrogen, and chlorine, but if Y is the same as Z, both are chlorine.

4,841,064
BACTERICIDAL (3,5-SUBSTITUTED POLYOXYMETHYLENE OXAZOLIDINES

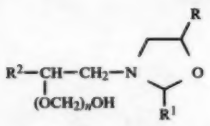
Kamlesh Gaglani, Passaic, and Albert Eilender, Montville, both of N.J., assignors to Cosan Chemical Corporation, Carlstadt, N.J.

Continuation of Ser. No. 942,041, Dec. 16, 1986, abandoned, which is a continuation of Ser. No. 676,901, Nov. 30, 1984, abandoned, which is a continuation of Ser. No. 418,256, Sep. 15, 1982, abandoned, which is a division of Ser. No. 304,809, Sep. 23, 1981, abandoned. This application Dec. 2, 1987, Ser. No. 127,552

Int. Cl.[4] C07D *263/06*

U.S. Cl. 548—215 **7 Claims**

1. A class of polyoxymethyleneoxazolidines having the structural formula:



wherein R is an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms or an aryl group of 6 to 10 carbon atoms; R^1 represents a hydrogen, an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, an aryl group of 6 to 10 carbon atoms, a substituted aryl group of 6 to 10 carbon atoms containing alkyl, halogen, alkoxy, or nitro substituents, R^2 represents an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, or an aryl group of 6 to 10 carbon atoms; and n represents an integer in the range of 1 to 8.

4,841,065
ISOXAZOLE DERIVATIVES WITH ANTIVIRAL ACTIVITIES AND PHARMACEUTICAL PRODUCTS CONTAINING THESE

Dieter Binder, Vienna; Franz Rovenszky, Bruck an der Leitha, and Hubert P. Ferber, Ansfelden, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

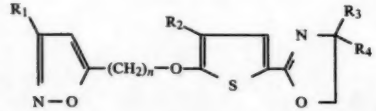
Filed Jan. 11, 1988, Ser. No. 142,677

Claims priority, application Austria, Jan. 28, 1987, 164/87

Int. Cl.[4] C07D *413/14;* A61K *31/42*

U.S. Cl. 548—238 **5 Claims**

1. A compound of the formula



in which

R_1 denotes C_1–C_4 alkyl,

R_2 denotes hydrogen, C_1–C_4 alkyl, chlorine or bromine,

R_3 and R_4, which are the same or different are hydrogen or C_1–C_4 alkyl, but not both hydrogen and n denotes the integer 6, 7 or 8.

4,841,066
PREPARATION OF 3-METHYL-1-VINYLIMIDAZOLIUM CHLORIDES

Hans-Helmut Goertz, Freinsheim; Ferdinand Straub, Hockenheim; Axel Sanner, Frankenthal; Albrecht Kolb, Weisenheim; Hans-Juergen Raubenheimer, Ketsch, and Friedrich Vogel, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

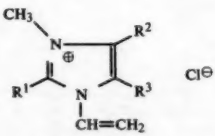
Filed May 13, 1987, Ser. No. 49,314

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3617069

Int. Cl.[4] C07D *233/58*

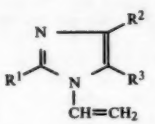
U.S. Cl. 548—335 **4 Claims**

1. A process for the preparation of a 3-methyl-1-vinylimidazolium chloride of the formula I



I

where R^1, R^2 and R^3 are each H or methyl, wherein a 10–70% strength by weight aqueous solution of an N-vinylimidazole of the formula II



II

where R^1, R^2 and R^3 are each H or methyl, is reacted with methyl chloride in an amount of from 90 to 110 mol %, based on the N-vinylimidazole of the formula II, at from 40° to 100° C. in a closed system.

4,841,067
NOVEL AMINO ACID DERIVATIVES

Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota, all of Nagano; Kenji Akahane, Tokyo; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Nagano, Japan

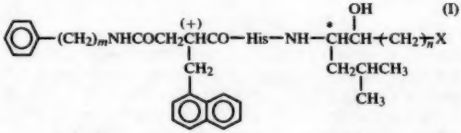
Continuation of Ser. No. 824,341, Jan. 31, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 233,962

Claims priority, application Japan, Jan. 31, 1985, 60-17563; Feb. 14, 1985, 60-27972; Mar. 1, 1985, 60-41614

Int. Cl.[4] C07D *233/64*

U.S. Cl. 548—344 **21 Claims**

1. An amino acid derivative represented by formula (I):



(I)

wherein X represents a straight or branched chain alkoxycarbonyl group having 2 to 10 carbon atoms, or aralkoxycarbonyl group having 8 to 10 carbon atoms, a hydroxymethyl group, or

wherein R^1 represents a hydrogen atom an alkyl group having 1 to 6 carbon atoms, or an aralkyl group having 7 to 10 carbon atoms and R^2 represents an alkyl group having 1 to 6 carbon atoms, or X represents $—CH_2—Y—R$ wherein Y represents —O— or —NH— and R represents a straight or branched chain alkyl group having 1 to 6 carbon atoms or an aralkyl group having 7 to 10 carbon atoms, $C^{(+)}$ represents (+) form, His represents as L-histidyl group and C* represents a carbon atom in the L-configuration, m represents an integer of from 1 to 3, and n represents 0 or 1; or a pharmaceutically acceptable salt thereof.

4,841,068

3-HYDROXY PYRAZOLE DERIVATIVES

Yoshihiro Fujikawa, Chiba; Masazumi Wakamatsu, Yamaguchi; Mariko Fukui, Tokyo, and Tadashi Miyasaka, Kanagawa, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

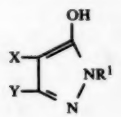
Filed Feb. 19, 1987, Ser. No. 16,618

Claims priority, application Japan, Feb. 19, 1986, 61-34320

Int. Cl.[4] C07D *231/46*

U.S. Cl. 548—365 **13 Claims**

1. A pyrazole compound represented by the general formula (I):



(I)

wherein:

R^1 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group substituted with an alkyl group having 1 to 4 carbon atoms or an alkyloxy group having 1 to 4 carbon atoms;

X is a nitroso group, an amino group or $(R^2)_2NCH{=}N—$(- wherein R^2 is an alkyl group having 1 to 3 carbon atoms); and

Y is $—C(O)NH_2$ when R^1 is an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group and X is a nitroso group, or $—C(O)NH_2$ when R^1 is, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group and X is an amino group, or CN or $—C(S)NH_2$ when R^1 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group and X is $(R^2)_2NCH{=}N—$(- wherein R^2 is the same as defined above).

4,841,069

AMMONOLYSIS-ALKYLATION REACTIONS USING AMMONIA AND AN ALCOHOL TO PREPARE N-ALKYL MALEIMIDES AND N-ALKYL SUCCINIMIDES

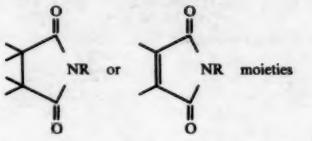
Robert J. Olsen, Lisle, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 30, 1987, Ser. No. 31,545

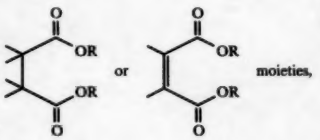
Int. Cl.[4] C07D *207/408, 207/452*

U.S. Cl. 548—545 **13 Claims**

1. A process comprising forming a first compound containing the

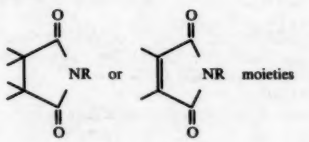


from a second compound containing the

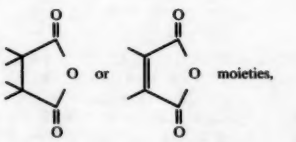


wherein R is H or a C_1 to C_8 alkyl radical, by contacting under reaction conditions said second compound with ammonia and the corresponding C_1 to C_8 alkanol.

8. A process comprising forming a first compound containing the



from a second compound containing the



wherein R is a C_1 to C_8 alkyl radical, by contacting under reaction conditions said second compound with ammonia and the corresponding C_1 to C_8 alkanol.

4,841,070

SULFINYL-ASCORBIC ACID USEFUL AS AN ANTI-OXIDANT

Horst Pauling, Bottmingen, and Christof Wehrli, Witterswil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 24, 1988, Ser. No. 211,514

Claims priority, application Switzerland, Jul. 9, 1987, 2616/87; Apr. 25, 1988, 1536/88

Int. Cl.[4] C07D *411/04*

U.S. Cl. 549—34 **5 Claims**

1. A compound selected from the group consisting of 5,6-sulfinyl-L-ascorbic acid and its stereoisomers.

4,841,071

6-SUBSTITUTED-4-HYDROXY-TETRAHYDROPYRAN-2-ONES

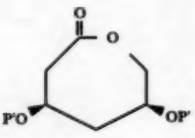
Prasad K. Kapa, Parsippany, N.J., assignor to Sandoz Pharm. Corp., E. Hanover, N.J.

Division of Ser. No. 512,163, Jul. 8, 1983, Pat. No. 4,571,428. This application Sep. 3, 1985, Ser. No. 771,809

Int. Cl.[4] C07D *313/00, 313/04*

U.S. Cl. 549—214 **6 Claims**

1. A compound of the formula:



wherein each P' is an hydroxy group-protecting group selected from the group consisting of tri-substituted silyl, benzyl, and substituted benzyl.

4,841,072

PREPARATION OF ALKYLENE CARBONATES

Robert J. Harvey, Teaneck, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Continuation of Ser. No. 326,447, Dec. 2, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 502,024

Int. Cl.[4] C07D *317/12*

U.S. Cl. 549—230 **14 Claims**

1. A process for preparing alkylene carbonates by the reaction of an alkylene oxide with carbon dioxide in the presence of water comprising carrying out said reaction at a temperature in the range of about 20°–90° C. and in the presence of an effective amount of an organic quaternary phosphonium halide.

4,841,073

RADICAL ANION SALTS OF DERIVATIVES OF 1,4,5,8-NAPHTHALENETETRACARBOXYLIC ACID AND THEIR USE

Tillmann Hassel, Cologne; Jürgen Hocker, Bergisch Gladbach; Gerhard Heywang, Bergisch Gladbach; Hans-Klaus Müller, Bergisch Gladbach, and Hans G. Fitzky, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

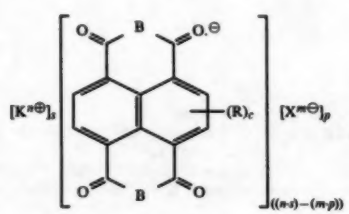
Filed Nov. 12, 1986, Ser. No. 928,942

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542485; Aug. 14, 1986, 3627667

Int. Cl.[4] C07D *493/06*

U.S. Cl. 549—232 **8 Claims**

1. A crystalline, stable radical anion salt of the formula



(I)

in which

K is an n-valent cation,

n is a whole number >0,

s is a whole number from 1 to 5,

X is an m-valent anion,

m is a whole number >0,

p is 0, 1 or a whole number >1, with the proviso that (m-p) may at most take the value ((n-s)−1);

B is oxygen,

R is halogen, nitro, hydroxyl, cyano, C_1–C_4-alkyl, cyclohexyl, phenyl, or a carboxylic acid ester and c is 0 or a whole number from 1 to 4.

4,841,074

INTERMEDIATES AND PROCESSES FOR 6-CARBOXY HMG-COA REDUCTASE INHIBITORS

Ta J. Lee, and William F. Hoffman, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

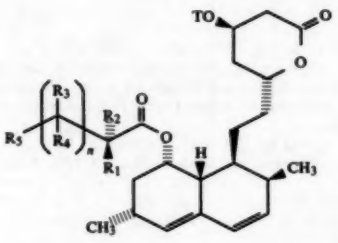
Filed Dec. 11, 1987, Ser. No. 131,695

Int. Cl.[4] C07D *309/30*

U.S. Cl. 549—292 **24 Claims**

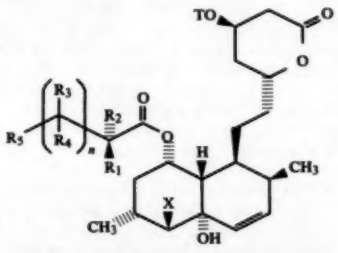
21. A process of claim 19 which further comprises:

(a) contacting a compound (2);



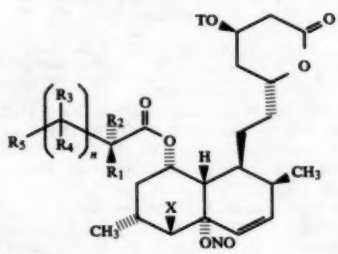
(2)

with phenylselenyl chloride or phenylselenyl bromide (X=Cl or Br) at about −80° C. in methylene chloride followed by treatment with 30% hydrogen peroxide in tetrahydrofuran at about 25° C. to yield a compound (3); then



(3)

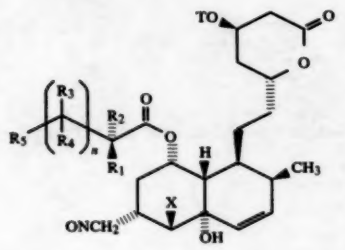
(b) reacting the compound (3) with nitrosyl chloride in pyridine to yield a compound (4);



(4)

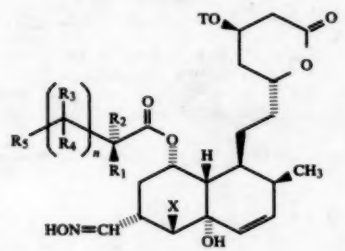
(c) irradiating the compound (4) with light of wavelength

greater than 320 Å in benzene-pyridine to yield a compound (5);



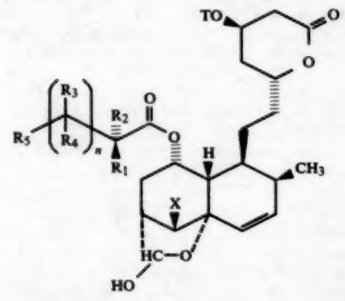
(5)

(d) heating the compound (5) in isopropanol at about 80° C. to afford compound (6); then



(6)

(e) treating compound (6) with an aqueous paraformaldehyde solution in the presence of an acid catalyst to yield a compound (7);



(7)

(f) contacting a compound (7) with pyridinium chlorochromate in methylene chloride to yield a compound (8).

4,841,075

METHOD OF PREPARING ACETAL OR KETAL

Hajime Matsushita, Yokohama; Makoto Shibagaki, Kawasaki; Kyoko Takahashi, Tokyo, and Hideyuki Kuno, Yokohama, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,702

Claims priority, application Japan, Dec. 11, 1986, 61-293470

Int. Cl.[4] C07D *317/00, 317/22*

U.S. Cl. 549—341 **5 Claims**

1. A method of preparing an acetal or ketal, which comprises causing an aldehyde or ketone to react with an alcohol by using a hydrous oxide of an element of Group IV of the Periodic Table as a catalyst, whereby the acetal or ketal corresponding to the aldehyde or ketone is obtained.

4,841,076

BENZOPYRAN DERIVATIVES

Masayuki Kitagawa, and Makoto Tanaka, both of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Japan

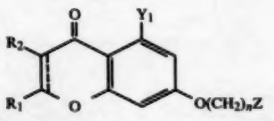
Filed Jun. 4, 1987, Ser. No. 58,105

Claims priority, application Japan, Jun. 4, 1986, 61-129420

Int. Cl.[4] C07D *311/22*

U.S. Cl. 549—401 **6 Claims**

1. A benzopyran derivative represented by the formula



(I)

wherein;

R_1 represents a hydrogen atom or a lower alkyl group;

R_2 represents a lower alkyl group, a cycloalkyl group, a phenyl group which may have one or more substituents selected from the group consisting of halogen atom, lower alkyl group, lower alkoxy group and hydroxyl group, or a phenylalkyl group;

Y_1 represents a halogen atom or a trihalomethyl group;

Z represents a carboxyl group, a lower alkoxycarbonyl group;

n represents an integer of from 1 to 6; and the

bond ⎓ between the 2- and 3-positions represents a single bond or a double bond; and pharmaceutically acceptable salts thereof.

4,841,077

ISOFLAVONE DERIVATIVES, AND SALTS THEREOF, AND CANCEROCIDAL AND IMMUNOSUPPRESSIVE AGENTS CONTAINING THE SAME

Noriki Ito, Saitama; Hiroshi Ogawara, Tokyo, and Shunichi Watanabe, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP86/00586, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/02982, PCT Pub. Date May 21, 1987

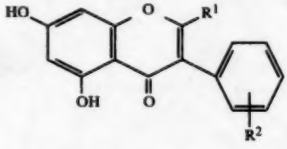
PCT Filed Nov. 17, 1986, Ser. No. 93,025

Claims priority, application Japan, Nov. 18, 1985, 60-259603

Int. Cl.[4] C07D *311/24*

U.S. Cl. 549—402 **2 Claims**

1. Isoflavone derivative represented by the general formula (I) or salt thereof;



(I)

wherein R^1 is —$COOR^7$; R^7 is a lower alkyl which may be substituted by one or two hydroxyl or lower alkoxy groups and R^2 is oxalyloxy or lower alkoxyoxalyloxy.

4,841,078

BENZOPYRANS

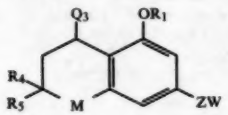
James F. Eggler, Stonington; Michael R. Johnson, Gales Ferry, and Lawrence Sherman, Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 457,171, Jan. 13, 1983, Pat. No. 4,486,428, which is a continuation-in-part of Ser. No. 358,751, Mar. 16, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,038

Int. Cl.[4] C07D *311/58, 405/12*

U.S. Cl. 549—402 **7 Claims**

1. A compound of the formula



and pharmaceutically acceptable cationic and acid addition salts thereof;

wherein

Q_3 is $COOR_7$, CONHOH, $CONHCONH_2$, $CONR_{12}R_{13}$, $CONHCOR_{19}$, $CONHSO_2R_{17}$, $CH_2CONHCOR_{19}$ or $COCH_2Q_4$, where

Q_4 is CN or $COOR_5$;

M is O;

R_1 is a member selected from the group consisting of hydrogen, benzyl, benzoyl, alkanoyl having from one to five carbon atoms and $—CO—(CH_2)_p—NR_{15}R_{16}$ wherein p is 0 or an integer from 1 to 4; each of R_{15} and R_{16} when taken individually is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_{15} and R_{16} when taken together with the nitrogen atom to which they are attached frm a 5- or 6-membered heterocyclic ring selected from the group consisting of piperidino, pyrrolo, and pyrrolidino;

R_4 is hydrogen, alkyl having from 1 to 6 carbon atoms or $—(CH_2)_z—C_6H_5$ wherein z is an integer from 1 to 4;

R_5 is hydrogen, methyl or ethyl;

R_7 is hydrogen, alkyl having from one to four carbon atoms or benzyl;

R_{12} and R_{13} are each hydrogen, alkyl having from one to six carbon atoms, phenyl or benzyl;

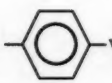
R_{17} is alkyl having from one to six carbon atoms, benzyl or $R_{18}C_6H_4$,

where R_{18} is H, NH_2, F, Cl, Br, CH_3, or OCH_3; R_{19} is R_7, phenyl or phenethyl; and

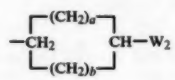
Z is selected from the group consisting of

(a) alkylene having from one to nine carbon atoms; and

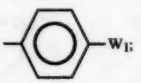
(b) $—(alk_1)_m—x—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and W is selected from the group consisting of hydrogen, methyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and



wherein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5.

4,841,079

PROCESS FOR THE PRODUCTION OF ASYMMETRIC HYDANTOINS

Frank J. Urban, Waterford, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed Aug. 7, 1987, Ser. No. 82,765

Int. Cl.[4] C07D *311/68*

U.S. Cl. 549—404 **8 Claims**

4. 4-Amino-6-fluoro-(2R)-methylchroman-4-carboxylic acid.

5. 6-Fluoro-(2R)-methyl-4-ureidochroman-4carboxylic acid.

4,841,080

PROCESS FOR THE OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

William D. Armstrong, Ramsey, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Division of Ser. No. 361,304, Mar. 24, 1982, Pat. No. 4,760,042. This application Feb. 16, 1988, Ser. No. 156,212

Int. Cl.[4] C07D *301/3*

U.S. Cl. 549—536 **12 Claims**

1. A process for the oxidation of ethylene with molecular oxygen to ethylene oxide under oxidizing conditions employing an alkali metal-promoted supported silver catalyst suitable for the oxidation of ethylene to ethylene oxide prepared by the steps comprising:

(a) impregnating a support with a solution of an organic silver salt; said support comprising alumina, silica, silica-alumina or combinations thereof having a surface area of about 0.1 to 1.0 m^2 and characterized by the ability to selectively adsorb an alkali metal in an amount greater than is calculalted from the amount in a solution thereof which has been adsorbed;

(b) separating the impregnated support of (a) from said solution and activating in the presence of molecular oxygen at a maximum temperature not exceeding 500° for a period of time sufficient to produce an active fresh silver catalyst having an average silver particle size of about 0.2–1.0 microns;

(c) post-impregnating the active catalyst of (b) with a solution of a compound of at least one alkali metal selected from the group consisting of Cs, K, and Rb in an amount determined by the amount of alkali compound in solution or an excess of such amount, followed by washing off said excess with 1–3 carbon alkanol, and producing a finished catalyst containing 25–500 wt ppm of said alkali metal, whereby a substantial fraction of said alkali metal post-impregnated is selectively adsosrbed.

4,841,081

METHOD OF OPTICALLY RESOLVING A RACEMATE OR A DIASTEREOMERIC MIXTURE OF GLYCIDYL COMPOUND

Fumio Toda, Ehime; Koichi Tanaka, Matsuyama, and Tetsuya Nakata, Ibaraki, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

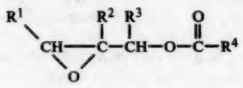
Filed Oct. 14, 1986, Ser. No. 918,724

Claims priority, application Japan, Oct. 16, 1985, 60-230686; Nov. 8, 1985, 60-251597; Dec. 13, 1985, 60-281567

Int. Cl.[4] C07D *301/32, 303/04;* C07C *69/76, 69/74*

U.S. Cl. 549—541 **18 Claims**

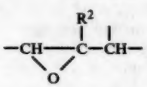
1. A method of optically resolving a racemate or a diastereomeric mixture of a compound selected from the group consisting of glycidyl ester compounds represented by the formula:



(II)-1

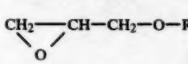
wherein R^1, R^2 and R^3, independently from each other, represent H or CH_3, R^4 represents a C_1–C_6 alkyl, C_6–C_{10} aryl, C_6–C_{10} aryl-C_1–C_2-alkyl, C_6–C_{10} aryl-C_2–C_4-alkenyl or C_2–C_4 alkenyl group, and when R^4 represents an alkyl group, R^1 and R^3 together may represent the moiety

together with the group



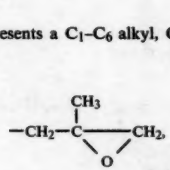
in the formula,

glycidyl ether compounds represented by the formula:

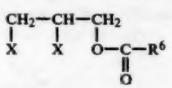


(II)-2

wherein R^5 represents a C_1–C_6 alkyl, C_6–C_{10} aryl, C_2–C_4 alkenyl or

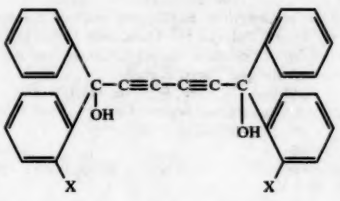


and compounds represented by the formula:



(II)-3

wherein X represents a halogen atom, and R^6 represents a C_1–C_6 alkyl, C_6–C_{10} aryl, C_6–C_{10} aryl-C_1–C_2-alkyl, C_6–C_{10} aryl-C_2–C_4-alkenyl or C_2–C_4 alkenyl group which comprises contacting said racemate or diastereomeric mixture with an optically active form of a compound having the following formula (I):



(I)

wherein X represents a halogen atom,

to form an inclusion complex compound having the optically active compound of formula (I) as a host, and separating the resulting complex compound from the mixture.

4,841,082

PREPARATION OF DIMETHYLZINC

Scott H. Eidt; Dennis L. Deavenport, both of Seabrook, and Nam H. Tran, Houston, all of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Aug. 19, 1988, Ser. No. 233,774

Int. Cl.[4] C07F *3/06*

U.S. Cl. 556—129 **5 Claims**

1. A process for the preparation of dimethylzinc which comprises heating a dimethylaluminum halide and a dialkylzinc under an inert atmosphere to achieve a redistribution reaction between the dimethylaluminum halide and dialkylzinc with distillative removal of the lower boiling dimethylzinc from the resulting reaction mixture wherein the alkyl groups are lower alkyl and the dialkylzinc is not dimethylzinc.

4,841,083

LADDER POLYSILANES

Yoichiro Nagai, Yamato, and Hideyuki Matsumoto, Kiryu, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

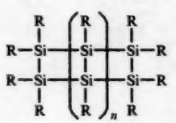
Filed May 27, 1988, Ser. No. 199,805

Claims priority, application Japan, Jun. 3, 1987, 62-138287

Int. Cl.[4] C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—430 **3 Claims**

1. A ladder polysilane represented by the general formula (I):



(I)

where n is a positive integer, and R is a halogen atom, a hydrogen atom, a hydroxyl group, an alkyl group, an alkenyl group, an aryl group or an alkoxy group having 20 or less carbon atoms, and said alkyl, alkenyl, aryl or alkoxy group may contain a functional group selected from the group consisting of —COOH, —SO_3H, —NH_2, —NO_2, —NCO, —F, —Cl, —Br, —I or —OH.

4,841,084
NEW HEXACOORDINATE SILICON COMPLEXES, THE PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION

Robert J. Corriu; Geneviève E. Cerveau, both of Montpellier; Claude G. Chuit, Palavas les Flots, and Catherine Reye, Montpellier, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

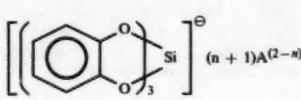
Filed Dec. 24, 1985, Ser. No. 813,128

Claims priority, application France, Dec. 27, 1984, 84 19886

Int. Cl.[4] C07F 7/08, 7/18

U.S. Cl. 556—464 **20 Claims**

1. A hexacoordinate silicon complex which corresponds to the general formula I:



(I)

in which:

A represents an alkali metal or alkaline earth metal except for magnesium, and

n=0 or 1.

4,841,085
ALDOPHOSPHAMIDES

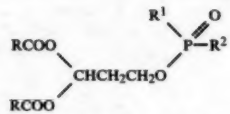
David Farquhar, and Yuqiang Wang, both of Houston, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Jun. 30, 1986, Ser. No. 879,910

Int. Cl.[4] C07F 9/40

U.S. Cl. 538—180 **9 Claims**

1. A compound having the structure



wherein R is CH_3 or C_2H_5; R^1 is NH_2, $NHCH_3$, NHC_2H_5, NHC_2H_4Cl, $N(CH_3)_2$, $N(C_2H_5)_2$, $N(C_2, H_4, Cl)_2OCH_3$, OC_2H_5, CH_3, or C_2H_5, and R^2 is $N(C_2H_4Cl)_2$ or NH C_2H_4Cl.

4,841,086
PROCESS FOR THE PREPARATION OF 2-CYANO-2-OXIMINO-ACETAMIDE DERIVATIVES

Herbert Gayer, Monheim, and Klaus Jelich, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

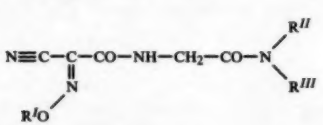
Filed Jan. 20, 1988, Ser. No. 146,051

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702283

Int. Cl.[4] C07C 121/66, 121/84; C07D 295/16

U.S. Cl. 558—301 **2 Claims**

1. A process for the preparation of a 2-cyano-2-oximino-acetamide derivative of the formula



in which

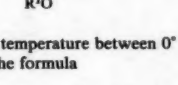
R^I represents straight-chain or branched alkyl having 1 to 4 carbon atoms, allyl, propargyl, cyanomethyl, cyanoethyl, phenylalkyl, having 1 or 2 carbon atoms in the alkyl part, which is optionally monosubstituted or independently disubstituted in the phenyl part by fluorine, chlorine, cyano, nitro, hydroxyl, methyl, methoxy, methylthio, methylsulphinyl, methylsulphonyl and phenyl which is optionally monosubstituted or disubstituted by fluorine or chlorine, the substituents being identical or different; or cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl or cycloheptyl which is in each case optionally monosubstituted or disubstituted by fluorine, chlorine or methyl, the substituents being identical or different;

R^{II} represent hydrogen, methyl or ethyl;

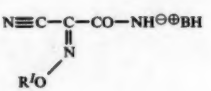
R^{III} represents hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, sec.-butyl, tert.-butyl, allyl, propargyl, halogenoalkyl having 1 or 2 carbon atoms and 1 to 3 identical or different halogen atoms, alkoxyalkyl having 1 or 2 carbon atoms in each of the alkoxy part and the alkyl part, dialkylaminoalkyl having 1 or 2 carbon atoms in the individual alkyl parts, alkoxycarbonylalkyl, hydroxycarbonylalkyl, aminocarbonylalkyl, alkylaminocarbonylalkyl with dialkylaminocarbonylalkyl in each case having 1 or 2 carbon atoms in each alkyl part, cyanoalkyl having 1 to 4 carbon atoms in the alkyl part; phenylalkyl, having 1 or 2 carbon atoms in the alkyl part, which is optionally monosubstituted or independently disubstituted in the phenyl part, or phenyl which is monosubstituted independently disubstituted, possible substituents in each cse being the phenyl substituents which have already been mentioned in the case of R^I; represents cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl or cycloheptyl which is in each case optionally monosubstituted or disubstituted by fluorine, chlorine or methyl, the substituents being identical or different, alkylcarbonylamino or alkoxycarbonylamino in each case having 1 or 2 carbon atoms in the alkyl part and in the alkoxy part respectively, aminocarbonylamino, methylaminocarbonylamino, ethylaminocarbonylamino, dimethylaminocarbonylamino, diethylaminocarbonylamino, methylethylaminocarbonylamino, or formylamino or the —N=CH—R^{IV} group, where

R^{IV} represents methyl, ethyl, or phenyl which is optionally monosubstituted or independently disubstituted, possible substituents being the phenyl substituents which have already been mentioned in the case of R^I;

comprising reacting a 2-cyano-2-oximino-acetamide of the formula



with a base B at a temperature between 0° C. and 100° C., to produce a salt of the formula



in which

B represents one equivalent of an organic of inorganic base, and reacting such salt directly or if appropriate, after intermediate isolation, with an alkylating agent of the formula

in which

X is halogen, methane- or p-toluenesulphonate or methyl sulphate, at a temperature between 0° C. and 150° C.

4,841,087

ACRYLONITRILE DIMERIZATION PROCESS

Marion J. Mathews III, and P. Robert Peoples, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

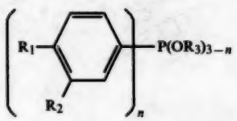
Continuation of Ser. No. 39,247, Apr. 17, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 169,069

Int. Cl.[4] C07C *121/20*

U.S. Cl. 558—363 5 Claims

1. In a process for dimerizing acrylonitrile to obtain 1,4-dicyanobutenes, said process comprising dissolving acrylonitrile in an organic solvent capable of donating protons but substantially unreactive with respect to acrylonitrile and organic phosphorus (III) compounds; contacting the acrylonitrile with an organic phosphorus (III) catalyst compound at a temperature from 0° to 120° C. under substantially anhydrous conditions; the improvement characterized in that:

(a) the catalyst is represented by the formula:



wherein n is 1 or 2; R_1 and R_2 are each hydrogen, alkyl, aryl, cycloalkyl or heteroatom containing substituents; R_3 is alkyl, cycloalky or aryl; and aryl moieties constitute at least 25% by weight of the catalyst

(b) the catalyst constitutes 16% to 90% by weight of the reaction mixture and at least 28% of the volume of any co-solvent present, and

(c) the rate constant is higher than obtained with an otherwise identical reaction mixture containing less than 16% by weight catalyst under identical conditions.

4,841,088

IODOPROPARGYL CARBAMATE DERIVATIVE, A METHOD FOR ITS PRODUCTION AND FUNGICIDAL COMPOSITIONS CONTAINING IT AS AN ACTIVE INGREDIENT

Tomoyuki Kusaba, Toyonaka; Junya Takahashi, Hyogo; Masayo Sugano, Osaka; Tamon Uematsu, Kobe; Yukio Oguri, Toyonaka, and Tomohiro Teramae, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

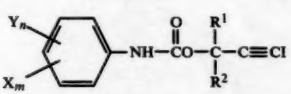
Filed Aug. 13, 1987, Ser. No. 84,885

Claims priority, application Japan, Aug. 26, 1986, 61-200274; Aug. 26, 1986, 61-200276; Dec. 22, 1986, 61-307390; Dec. 23, 1986, 61-315812

Int. Cl.[4] C07C *121/52*

U.S. Cl. 558—417 6 Claims

1. A compound represented by the general formula,



wherein X, which may be the same or different, represents a cyano, nitro, halogenated lower alkyl, C_1–C_{12} alkoxy, lower alkoxy-substituted lower alkyl, lower alkenyloxy, lower alkynyloxy, halogenated lower alkoxy, lower alkoxycarbonyl or lower alkylthio group, R^1 and R^2, which may be the same or different, represent a hydrogen atom or a methyl group, Y represents a chlorine atom, m represents an integer of from 1 to 5, and n represents an integer of from 0 to 4, the sum of m and n being less than 6.

4,841,089

PROCESS FOR THE PREPARATION OF 4-MERCAPTOBENZONITRILES, AND 4-MERCAPTOBENZONITRILES

Hermann Hagemann, Leverkusen, and Klaus Sasse, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,935

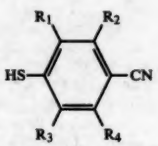
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543036

Int. Cl.[4] C07C *121/52*

U.S. Cl. 558—412 4 Claims

1. A 4-mercaptobenzonitrile selected from the group consisting of 4-mercapto-5-fluorobenzonitrile, 4-mercapto-5-chlorobenzonitrile, 4-mercapto-5-bromobenzonitrile, 4-mercapto-5-methylbenzonitrile, 4-mercapto-5-trifluoromethylbenzonitrile, 2-chloro-4-mercaptobenzonitrile, 2-methyl-4-mercaptobenzonitrile, 2-trifluoromethyl-4-mercaptobenzonitrile and 2-cyano-4-mercaptobenzonitrile.

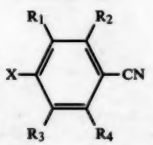
2. A process for the preparation of a 4-mercaptobenzonitrile of the formula



in which

R_1, R_2, R_3 and R_4, each independently represents hydrogen, unsubstituted or substituted lower alkyl or unsubstituted or substituted lower alkoxy,

wherein a 4-halogenobenzonitrile of the formula



in which

R_1, R_2, R_3 and R_4 have the abovementioned meanings and X represents a halogen atom, is reacted at a temperature of 80 to 180° C. with 0.8 to 1.2 moles of sodium sulfide per mole of 4-halogenobenzonitrile or 2 to 4 moles of sodium hydrogen sulfide per mol of 4-halogenobenzonitrile in the presence of an inert organic solvent, and the reaction mixture is subsequently acidified at a temperature of −10° to 50° C. until a pH of less than 3 is reached.

4,841,090

TREATMENT OF FIBROUS SUBSTRATES, SUCH AS CARPET, WITH FLUOROCHEMICAL

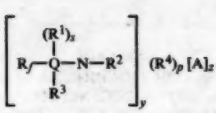
Kalyanji U. Patel, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 805,589, Dec. 9, 1985, abandoned, which is a continuation of Ser. No. 387,444, Jun. 11, 1982, abandoned. This application Sep. 29, 1987, Ser. No. 102,259

Int. Cl.[4] C07C *121/66, 121/75*

U.S. Cl. 558—437 6 Claims

1. Compounds of the formula



where

R_f is a fluorinated, saturated, monovalent, aliphatic, stable, non-polar, inert, oleophobic, hydrophobic radical having 3 to 20 carbon atoms and 40 to 78 weight percent fluorine and terminating in at least three fully fluorinated carbon atoms;

Q is an organic linking group which is one or a combination of polyvalent aliphatic groups, polyvalent aromatic groups, oxy (—O—), thio (—S—), carbonyl (—CO—), sulfonamido

carbonamido

hydroxymethylene (—CH(OH)—), carbamato (—NHCOO—) and urylene (—NHCONH) organic linking moieties, with the proviso that the moiety of Q which is bonded to the nitrogen atom of the amine salt group is not an electrophilic moiety and that Q is bonded to the nitrogen atom of the amine salt group by a methylene moiety;

N is a tertiary amino nitrogen atom or quaternary amino nitrogen atom;

R^1 is a hydrogen or an alkyl group,

R^2 is R_fQ—, alkyl groups, alkyl groups containing an —O— hetero atom, alkyl groups containing an —S— hetero atom, alkyl groups containing an

hetero atom, aryl groups, aryl groups containing an —O— hetero atom, aryl groups containing an —S— hetero atom, aryl groups containing an

hetero atom, combinations of such groups, alkylene groups, arylene groups or combinations of arylene and alkylene groups;

R^3 is a cyanoalkyl moiety;

R^4 is an alkylene or arylene group;

A is an anion derived from a protonic acid or an alkylating agent;

s is 1;

y is 1 to 4;

p is 0 to 1;

z is 1 to 4;

with the provisos that

(1) when y is 1, then p is 0 and z is 1, and (2) when y is 2, then R^2 is said alkylene or arylene group or combination thereof, and said compounds contain at least about 20 weight-percent carbon-bonded fluorine the locus of which is in said R_f radical.

4,841,091

PROCESS FOR PRODUCING 16-SUBSTITUTED PROSTAGLANDIN ES.

Toshio Tanaka; Atsuo Hazato; Seizi Kurozumi, all of Tokyo, and Masahiro Koga, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP86/00034, § 371 Date Sep. 29, 1986, § 102(e) Date Sep. 29, 1986, PCT Pub. No. WO86/04330, PCT Pub. Date Jul. 31, 1986

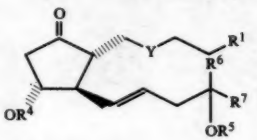
PCT Filed Jan. 28, 1986, Ser. No. 913,889

Claims priority, application Japan, Jan. 29, 1985, 60-13527; Oct. 29, 1985, 60-240439

Int. Cl.[4] C07C *177/00*

U.S. Cl. 558—441 **1 Claim**

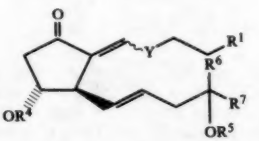
1. A process for producing 16-substituted prostaglandin Es, which include compounds expressed by the following formula (I), or their enantiomers, or their mixtures of arbitrary mixing ratio,



(I)

wherein R^1 indicates $COOR^2$, CH_2OR^3, in which R^2 indicates a hydrogen atom, a substituted or unsubstituted C_1–C_{10} alkyl group, a substituted or unsubstituted C_3–C_{10} cycloalkyl group, or a substituted or unsubstituted phenyl group, and R^3 indicates a hydrogen atom, a tri(C_1–C_7) hydrocarbon silyl group, a group which forms an acetal bond together with the oxygen atom of a hydroxyl group, or a C_2–C_7 aryl group: R^4 and R^5 are identical or different, each representing a hydrogen atom, a tri(C_1–C_7) hydrocarbon silyl group, or a group which forms an acetal bond together with the oxygen atom of a hydroxyl group; R^6 indicates a hydrogen atom, a C_1–C_4 alkyl group, or vinyl group; R^7 indicates a linear or branched C_3–C_8 alkyl group, an alkenyl group, or an alkynyl group, which may contain an oxygen atom; a phenyl group, a phenoxy group, or a C_3–C_{10} cycloalkyl group, which may be substituted; or a linear or branched C_1–C_5 alkyl group which is substituted by a C_1–C_6 alkoxy group, a phenyl group, a phenoxy group, or a C_3–C_{10} cycloalkyl group, which may be substituted; and Y indicates CH_2X or XCH_2, in which X represents an ethylene group, a cis- or trans-vinylene group, or an ethynylene group,

which process comprises selectively reducing using an organic tin hydride compound and a zerovalent palladium catalyst the double bonds at the 7- and 8-positions of 16-substituted Δ^7-prostaglandin Es, which include compounds expressed by the following formula (II), their enantiomers, or their mixtures of arbitrary mixing ratio, further followed by the deprotecting reaction and/or the hydrolytic reaction, if necessary,



(II)

wherein R^1, R^4, R^5, R^6, R^7, and Y are as defined hereinabove.

4,841,092

PREPARATION OF TRIS(2-CYANOETHYL)AMINE

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed May 23, 1988, Ser. No. 197,152

Int. Cl.[4] C07C *121/43*

U.S. Cl. 558—455 3 Claims

1. A process for the production of tris(2-cyanoethyl)amine which comprises (a) reacting at a temperature of 70° C. to 105° C. a mixture consisting essentially of acrylonitrile, water, an ammonium salt of aliphatic acid having 1 to 6 carbon atoms or hydroxy acetic acid or sulfoacetic acid, and a sufficient amount of an aliphatic acid having 1 to 6 carbon atoms or hydroxyacetic acid or sulfoacetic acid to give the mixture an initial pH of less than 7, and then (b) adding sufficient alkali metal hydroxide to raise the pH to 11 or higher, to precipitate tris(2-cyanoethyl)amine.

4,841,093

AROMATIC DICARBOXYLIC ACID DIALLYL ESTER DERIVATIVE, PREPOLYMER DERIVED FROM THE DERIVATIVE AND CURABLE RESIN COMPOSITION CONTAINING THE DERIVATIVE

Sinji Tamaru, Suita, and Motonobu Kubo, Toyonaka, both of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

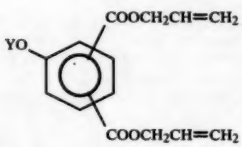
Filed Oct. 19, 1987, Ser. No. 109,413

Claims priority, application Japan, Oct. 22, 1986, 61-252439; Dec. 23, 1986, 61-314653; Dec. 24, 1986, 61-314517; Dec. 24, 1986, 61-314518

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—65 1 Claim

1. A diallyl aromatic dicarboxylate derivative of the formula



(I)

wherein Y is a perfluoroalkenyl group having 6 to 14 carbon atoms.

4,841,094

PREPARATION OF MONOMERS

Ian D. H. Towle, Cricencester, England, assignor to Raychem Limited, London, England

Division of Ser. No. 877,658, Jun. 3, 1986, Pat. No. 4,777,282. This application Jul. 29, 1988, Ser. No. 204,650

Claims priority, application United Kingdom, Aug. 27, 1985, 8521324

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—73 6 Claims

1. A method for the preparation of an organic compound comprising reacting a first compound of the formula:

$$(R)_r—M—Y—A^1—Y—M—(R)_r$$

where

each R is independently a substituted or unsubstituted alkyl or aryl group;

each r is independently an integer from 1 to 4 inclusive depending upon the element M used;

each M is independently an element selected from gallium, indium thallium, arsenic, antimony, or bismuth;

each Y is independently an oxygen atom, a sulphur atom, a substituted nitrogen atom other than —NH—, or a substituted phosphorus atom other than —PH—, —$P(H)_3$—, or —P(OH)—; and

A^1 is an aromatic, aliphatic, aromatic/aliphatic, heterocyclic, alicyclic, siloxyl or silane group,

with a second compound of the formula:

where

X is a halogen atom or a group capable of reacting with the first compound to eliminate a compound containing M and X;

B is an atom selected from carbon, phosphorus, sulphur or silicon;

D is an oxygen or sulphur atom or an amine group;

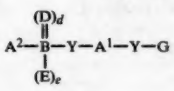
d is 1 if B is carbon, zero or 1 if B is phosphorus, zero, 1 or 2 if B is sulphur or zero if B is silicon;

E is selected from an aromatic group, aliphatic group, OR′ or NR'_2 if B is phosphorus, or from an aromatic group, aliphatic group or OR′ if B is silicon, where R′ is a substituted or unsubstituted alkyl or aryl group;

e is zero if B is carbon or sulphur, 1 if B is phosphorus or 2 if B is silicon; and

A^2 is an aromatic, aliphatic, aromatic/aliphatic, heterocyclic, alicyclic, siloxyl or silane group,

to eliminate the compound $(R)_rMX$ and produce a compound of the formula:



where G is either the group —M—$(R)_r$ or the group

4,841,095

MODIFIED POLYISOCYANATES WITH BIURET STRUCTURE AND PROCESS FOR THEIR PREPARATION

Eugenio Bianchin, Treviso; Giovanni Longo, Spinea, and Gian F. Lunardon, Paduva, all of Italy, assignors to Montedison S.p.A., Milan, Italy

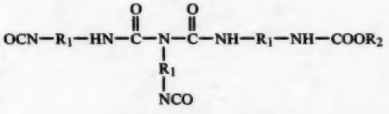
Continuation of Ser. No. 23,952, Mar. 11, 1987, abandoned, which is a continuation of Ser. No. 784,572, Oct. 4, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 134,595

Claims priority, application Italy, Oct. 5, 1984, 23003 A/84

Int. Cl.[4] C07C *125/06*

U.S. Cl. 560—115 15 Claims

1. A process for the preparation of modified polyisocyanates having a biuret structure as set forth below:



wherein R_1 is a radical selected from the group consisting of unsubstituted aliphatic, cycloaliphatic and aliphaticcycloaliphatic radicals, said radicals having one or more hydrogen atoms substituted by halogen, NO_2, a non reactive hydroxy, an alkyl radical or an alkoxy radical; and R_2 is the radical

$R_3(OC_nH_{2n})_x$— wherein R_3 is an alkyl or acetyl radical having a maximum of 18 carbon atoms, n is a whole number selected from 2, 3 and 4 and X is a whole number selected from 1 to 50, the process consisting of reacting water or a compound containing water of crystallization which splits off water, with an organic diisocyanate, in a diisocyanate/water molar ratio lower than 10:1, in the presence of an angent which forms a homogeneous phase with water and the diisocyanate under the reaction conditions and throughout the reaction period, and which has a hydrogen atom which reacts with the isocyanate group as determined by the Zerewitinoff method.

4,841,096

CYCLOHEXANE-2,5-DIONE-1,4-YLENE-BIS (-3-PROPIONIC ACID) DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Masahiko Miyashita, Osaka, Japan, assignor to Nippon Gosei Kaagaku Kogyo, Japan

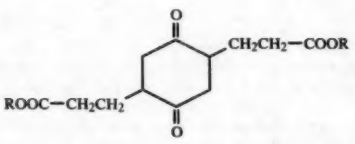
Continuation-in-part of Ser. No. 835,531, Mar. 3, 1986, abandoned, and a continuation-in-part of Ser. No. 878,199, Jun. 25, 1986, Pat. No. 4,772,432. This application Dec. 8, 1987, Ser. No. 129,982

Claims priority, application Japan, Mar. 5, 1985, 60-43019; Jul. 27, 1985, 60-166081

Int. Cl.[4] **C07C** *69/75*

U.S. Cl. 560—126 **5 Claims**

1. A cyclohexane-2,5-dione-1,4-ylene-bis(-3-propionic acid) derivative represented by the formula



wherein R is hydrogen or alkyl having 1 to 10 carbon atoms.

4,841,097

DIALKANOYLOXYBENZYLIDENE DIALKANOATE

Hitoshi Takita; Fumihiko Kimura; Sakuo Noda, all of Tokyo; Yutaka Mukaida, Moroyama; Toyohiko Nitta, and Hidetoshi Kobayashi, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

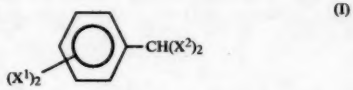
Division of Ser. No. 681,289, Dec. 13, 1984, abandoned. This application Apr. 13, 1988, Ser. No. 181,177

Claims priority, application Japan, Dec. 26, 1983, 58-251692; Jun. 22, 1984, 59-128789

Int. Cl.[4] **C07C** *69/035, 67/08;* **C09F** *5/08*

U.S. Cl. 560—144 **4 Claims**

1. A process for producing a dialkanoyloxy-benzylidene dialkanoate of the formula (I):

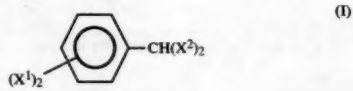


(I)

wherein X^1 and X^2 are an alkanoyloxy group having from 1 to 18 carbon atoms, which comprises the step:

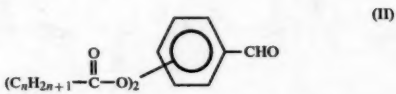
(i) reacting a dihydroxybenzaldehyde with an alkanoic acid anhydride of the formula $(C_mH_{2m+1}—CO)_2O$, wherein m is an integer of 1 to 18 in the presence of base with heating or in the presence of strong acid.

2. A process for producing a dialkanoyloxy-benzylidene dialkanoate of the formula (I):



(I)

wherein X^1 and X^2 are, independently, an alkanoyloxy group having from 1 to 18 carbon atoms, which comprises the steps: (i) reacting a dihydroxybenzaldehyde with an alkanoic acid anhydride of the formula $(C_nH_{2n+1}—CO)_2O$, wherein n is an integer of 1 to 18, to obtain a dialkanoyloxybenzaldehyde of the formula (II):



(II)

(ii) reacting said dialkanoyloxybenzaldehyde with an alkanoic acid anhydride of the formula $(C_mH_{2m+1}—CO)_2O$, wherein m is an integer of 1 to 18, in the presence of base with heating or in the presence of strong acid.

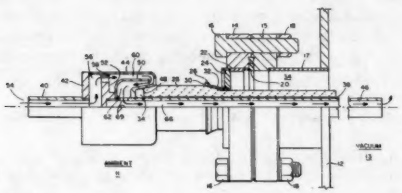
ELECTRICAL

4,841,098

HIGH POWER RADIO FREQUENCY ENERGY FEEDTHROUGH FOR HIGH VACUUM VESSEL

Arthur R. Dunton, Englewood, Fla., assignor to Insulator Seal, Inc., Englewood, Fla.

Filed Jun. 9, 1988, Ser. No. 204,393
Int. Cl.[4] H01B *17/30, 17/54*
U.S. Cl. 174—15.3 **9 Claims**



1. A fluid coolable feedthrough for conducting electrical energy at high power levels through a wall of a pressure or vacuum vessel, the feedthrough comprising:

mounting flange means for mounting the feedthrough to flange mating means formed at the wall of the vessel, the mounting flange means including sealing means for sealing the flange means to the flange mating means in a pressure or vacuum sealing arrangement,

insulator tube means secured to said mounting flange means in a pressure or vacuum sealing arrangement,

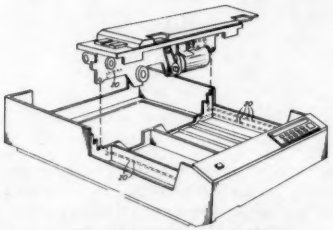
conductor tube means secured to said insulator tube means at a bonding region at an outer end thereof for conducting said electrical energy at high power levels and for carrying cooling fluid therethrough, said conductor tube means defining at least one interior cooling fluid flow passage directly adjacent to said bonding region for conducting away the heat generated at said region incident to the passage of said electrical energy at high power levels, said insulator tube means being for insulating said conductor tube means for said mounting flange means and from said wall.

4,841,099

ELECTRICALLY INSULATING POLYMER MATRIX WITH CONDUCTIVE PATH FORMED IN SITU

Arthur J. Epstein, Bexley, Ohio; Joan R. Ewing, Fairport, and Joseph A. Swift, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1988, Ser. No. 188,984
Int. Cl.[4] H05K *1/00;* **B23K** *31/00*
U.S. Cl. 174—68.5 **44 Claims**



1. An electrical component comprising an electrically insulating polymer matrix filled with an electrically insulating fibrous filler capable of heat conversion to an electrically conducting fibrous filler, said electrically insulating polymer matrix including at least one continuous electrically conductive path formed by the in situ heat conversion of said electrically insulating fibrous filler.

15. A method of forming at least one electrically conductive path in a polymer matrix comprising providing an electrically insulating structural polymer matrix filled with electrically insulating fibrous filler capable of heat conversion to an electrically conducting fibrous filler, heating the portion of said polymer matrix corresponding to a desired conductive path to a temperature sufficient to convert said electrically insulating fibrous filler to an electrically conductive fibrous filler thereby providing said at least one electrically conductive path.

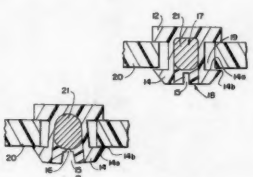
31. A machine including a plurality of electrical components each requiring the supply of electrical current for proper functioning, said machine including at least one support member comprising an electrically insulating structural polymer matrix filled with an electrically insulating fibrous filler capable of heat conversion to an electrically conducting fibrous filler said electrically insulating structural polymer matrix including at least one continuous electrically conductive path between electrical components formed by the in situ head conversion of said electrically insulating fibrous filler.

4,841,100

EXPANDING SURFACE MOUNT COMPATIBLE RETAINER POST

Martin C. Ignasiak, Mentor, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 2, 1987, Ser. No. 92,063
Int. Cl.[4] H05K *1/18*
U.S. Cl. 174—138 G **19 Claims**



1. A retainer post for insertion in a hole in a printed circuit board in order to mount a device to such board, comprising:

a resilient body including a neck section insertable in a printed circuit board, a shoulder section means adjoining said neck station for engaging the surface of a printed circuit board to prevent said body from passing completely through such a hole, said neck section being diametrically expandable in response to internal bursting pressure applied to said neck section, a bursting means for expanding in response to an increase in temperature to expand said neck section to cause the retainer post to engage a printed circuit board in which it is inserted, and reservoir means for retaining said bursting means, said reservoir means being disposed within said neck section.

4,841,101

HERMETICALLY SEALED FEEDTHROUGHS AND METHODS OF MAKING SAME

John A. Pollock, c/o Product Engineering Associates Inc., P.O. Box 269, Wilton, N.H. 03086

Filed Dec. 21, 1987, Ser. No. 135,602
Int. Cl.[4] H01B *17/30;* **B23K** *3/02*
U.S. Cl. 174—152 GM **12 Claims**

1. The method of making a hermetically sealed electrical feedthrough connection into an enclosure bulkhead of a high expansion metal, said method comprising:

bonding a connector pin into a tubular ferrule using a glass-like insulating material, said ferrule being constructed of a metal having a coefficient of expansion which approximates that of said insulating material, said ferrule being of

substantially uniform outer diameter over most of its length but having, at its inner end, a shallow rim having a height which is substantially equal to the thickness of a maximally compliant solder joint;

boring a feedthrough port into an enclosure bulkhead of a high expansion metal, said port having a diameter over most of its length which will accept said rim with minimal clearance;

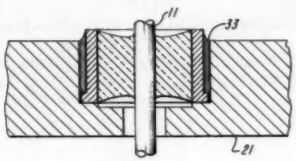
inserting said ferrule into said port rim end first with said rim centering the remaining length of the ferrule within the bore with essential uniform clearance; and

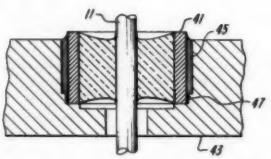
introducing molten solder into said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

5. The method of making a hermetically sealed electrical feedthrough connection into an enclosure bulkhead of a high expansion metal, said method comprising:

bonding a connector pin into a tubular ferrule using a glass-like insulating material, said ferrule being constructed of a metal having a coefficient of expansion which approximates that of said insulating material, said ferrule being of substantially uniform outer diameter over its length;

boring a feedthrough port into an enclosure bulkhead of a high expansion metal, said port having a diameter over most of its length which will accept said ferrule with clearance which is substantially equal to the thickness of a maximally compliant solder joint and having, at the inner end of said port, a portion of reduced diameter which will receive one end of said ferrule with minimal clearance;





inserting said ferrule into said port with said portion of reduced diameter centering the remaining length of the ferrule within the bore with essential uniform clearance; and

introducing molten solder into said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

9. In an enclosure bulkhead of a high expansion metal, a hermetically sealed electrical feedthrough connection comprising:

a tubular ferrule constructed of a metal having a coefficient of expansion which approximates that of glass, said ferrule being of substantially uniform outer diameter over most of its length but having, at its inner end, a shallow rim having a height which is substantially equal to the thickness of a maximally compliant solder joint;

a connector pin concentric within said ferrule;

a glass-like insulator bonded between said pin and said ferrule;

a feedthrough port in said enclosure bulkhead, said port having a diameter over most of its length which will accept said rim with minimal clearance, said ferrule being inserted into said port rim end first with said rim centering the remaining length of the ferrule within the bore with essential uniform clearance; and

solder filling said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

11. In an enclosure bulkhead of a high expansion metal, a hermetically sealed electrical feedthrough connection comprising:

a tubular ferrule constructed of a metal having a coefficient of expansion which approximates that of glass, said ferrule being of substantially uniform outer diameter over its length;

a connector pin concentric within said ferrule;

a glass-like insulator bonded between said pin and said ferrule;

a feedthrough port in said enclosure bulkhead, said port having a diameter over most of its length which will accept said ferrule with clearance which is substantially equal to the thickness of a maximally compliant solder joint and having, at the inner end of said port, a portion of reduced diameter which will receive said ferrule with minimal clearance, said ferrule being inserted into said port with said portion of reduced diameter centering the remaining length of the ferrule within the bore with essential uniform clearance; and

solder filling said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

4,841,102

ELECTROMAGNETIC SHIELDING ARRANGEMENT

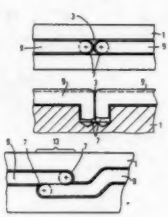
Hans F. K. Elsner, Bremen; Peter W. Prendel, Weyhe; Wilfried H. K. Kandler, Achim, and Jürgen Sandkuhl, Weyhe-Leeste, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,771

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703787

Int. Cl.[4] H05K *9/00*; **G12B** *17/02*; **F16J** *15/12*; **B65D** *53/00*

U.S. Cl. 174—35 GC **4 Claims**

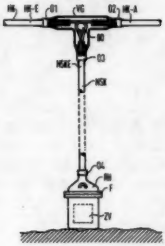


1. A shielding arrangement comprising a stranded elastic shielding body having a substantially constant cross-section, which body is arranged between two housing parts in a groove provided in the surface of one of the housing parts, characterized in that the two ends of the shielding body are each inserted into a blind hole directed perpendicularly to the surface of the one housing part and located in the groove.

4,841,103
ARRANGEMENT FOR THE CONNECTION OF AN INTERMEDIATE REPEATER FOR SUBMARINE CABLES

Ulrich Oestreich, Munich, and Wolfgang Giebel, Traubing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,881
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726358
Int. Cl.[4] H04B *3/44;* H02G *15/14, 9/02;* H01B *11/16*
U.S. Cl. 174—70 S 13 Claims



13. In a submarine intermediate repeater station comprising a repeater and a main cable, an arrangement for the connection of said repeater to said main cable comprising:

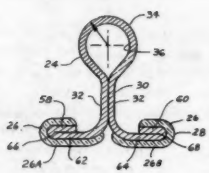
a connector element in said main cable; and,

an umbilical cable connected between said connector element and said repeater and carrying signal lines and supply lines between said main cable and said repeater and being of sufficient length so as to allow said repeater to be brought to the surface of the body of water under which said repeater is submersed without thereby disturbing said main cable.

4,841,104
ELECTRIC TOY TRAIN TRACK

Robert Adell, 200 Adell Blvd., Sunnyvale, Tex. 75182

Filed Mar. 21, 1988, Ser. No. 170,536
Int. Cl.[4] B60M *1/30*
U.S. Cl. 191—29 R 1 Claim

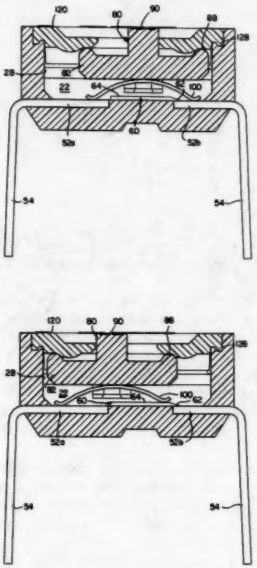


1. An electric toy train track power rail comprising a length of a formed conductive metal strip to which electrical insulation has been selectively applied continuously along the length thereof such that in transverse view the power rail comprises a horizontal base having a bottom, sides, and a top, and an upright centrally supported on the base to provide electrical continuity to an electric toy train that runs on a track that contains the power rail, said electrical insulation being disposed in covering relation to the bottom and sides of the base and in covering relation to at least a portion of the top of the base immediately contiguous each side, in which the base is defined by longitudinal margins of the metal strip and said insulation is disposed as two separate and discrete zones, one zone for one margin, the other zone for the other margin, said zones being separated at the bottom of said base by a gap that is disposed directly below said upright.

4,841,105
SLIDE SWITCH CONFIGURED AS AN INTEGRATED CIRCUIT PACKAGE

Joseph R. Goodman, Walkertown, and Roger L. Thrush, Clemmons, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 11, 1988, Ser. No. 179,603
Int. Cl.[4] H01H *15/00*
U.S. Cl. 200—16 D 10 Claims



1. A switch configured as an integrated circuit package including a housing body comprised of an insulating material with a plurality of leads extending from the body, the leads being arranged in first and second opposed rows with fixed ends of the leads being in a spaced apart and facing relation and disposed in a generally horizontal plane on a floor of the housing body, each pair of opposed fixed ends being in alignment with an associated slide switch element, where each slide switch element comprises a bow shaped element with first and second contact portions at ends of the bow adjacent to respective first and second fixed ends of the leads, each of the slide switch elements being moveable between a first position where two opposed fixed ends are commoned by the first and second contact portions of the respective slide switch element bridging between the first and second fixed ends, to a second position where the contact portions only contact the second said fixed end, thereby breaking the continuity between the first and second fixed ends, the switch being characterized in that:

the housing body includes two ramp elements which extend at least partially between, and flank the widths of, the first and second fixed ends of the leads, and in that each slide switch element includes two integral tabs adjacent to the first contact portion which engage the two ramp elements, which, upon movement of each of the slide switch elements, cause the tabs to slide up the ramp elements,

thereby lifting the first contact portions of the slide switch elements vertically away from the floor of the body.

4,841,106

SYMMETRIC PERCUSSION SWITCHING DEVICE USING A HEAD POINT OVER-RUN DEVICE

Bruno Jacquet, Rueil Malmaison; Frédéric Noirot, Asnieres Sur Seine, and Jean-Pierre Tellier, Jouy Le Moutier, all of France, assignors to La Telemecanique Electrique, France

Filed Aug. 13, 1987, Ser. No. 84,730

Claims priority, application France, Aug. 14, 1986, 86 11737

Int. Cl.[4] H01H *21/42*

U.S. Cl. 200—462 **7 Claims**

1. A double percussion snap-acting switching device comprising:

(i) a bistable dead center over-run device including: a toggle arm mounted about a fixed axis for rocking between first and second positions and having a striker part; at least first and second stops respectively defining said first and second positions, a control means whose displacement causes rocking of the toggle arm from one to the other of said positions after passing through a dead center and a spring connected between said control means and said toggle arm;

(ii) first and second switches each comprising a fixed switch contact and a rigid switch arm carrying a movable switch contact and a surface portion on the switch arm disposed for engagement by said striker part after said toggle arm passes the dead center;

(iii) first and second further spring means respectively biasing the rigid switch arms of the respective switches towards the respective fixed switch contact with an antagonistic force lower than that produced by the toggle arm, said toggle arm exerting on each rigid switch arm a force which is a linear function of the displacement of said toggle arm having a first predetermined slope, whereas each rigid switch arm exerts on said toggle arm a resistance force which is a linear function of said displacement having a second predetermined slope, said first slope being substantially larger than said second slope.

4,841,107

DEVICE FOR INDICATING THE FILLING LEVEL IN A FLUID RESERVOIR

Peter Tandler, Kronberg/Ts., and Rudolf Cezanne, Hofheim/Ts., both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

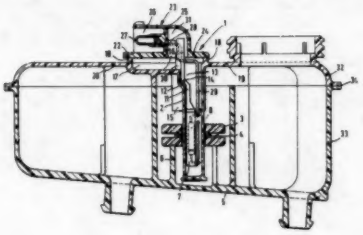
Filed May 3, 1988, Ser. No. 189,857

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716135

Int. Cl.[4] H01H *35/18*

U.S. Cl. 200—84 C **5 Claims**

1. A device for indicating the filling level in a fluid reservoir in a vehicular hydraulic brake system, comprising a guide tube extending into the fluid reservoir, alongside of which guide tube a float is displaceably arranged, said float including at least one magnet by means of which at least one reed switch arranged inside the guide tube is actuatable when the float reaches a predetermined position, said reed switch being connected by at least one electric wire extending from the interior of the guide tube to at least one plug-and-socket connector contact arranged in a cap, wherein the magnet is arranged in a first radial recess in the float, said first radial recess forming



side walls, said side walls including retaining means for securing the magnet in an installed position on said float, wherein the retaining means are shaped in the form of elastically deformable snap-in projections formed at the side walls of the first radial recess.

4,841,108

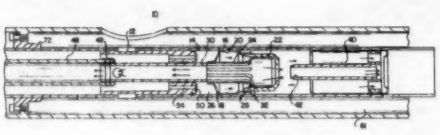
RECLOSER PLENUM PUFFER INTERRUPTER

Sidney R. Hamm, Muskego, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 6, 1987, Ser. No. 117,604

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **17 Claims**



1. A distribution class interrupter, comprising:

an outer housing adapted to contain an arc extinguishing fluid therein;

an interrupter tube mounted within said housing;

a first elongated electrical current carrying member carried within said tube;

a second elongated current carrying member which is disposed end-to-end with said first member and which is movable within said tube between a closed position where it is in electrical contact with said first member and an opened position where it is spaced from said first member, said first member and said second member defining a gap when said second member is in its opened position such that an electrical arc is formed across said gap as said first member is separated from said second member, at least one of said first and second current-carrying members defining an internal passageway in fluid communication with said gap and the interior of said housing for directing ionized fluid thereformed, said second member being adapted to be operated by a prime mover to stroke said second member between its opened position and its closed position;

piston means, carried by said second member, for supplying pressurized fluid into said gap as said second member is moved into its opened position, said piston means moving between an open position and a closed position in response to said prime mover;

base means, carried by said interrupter tube for supporting said second elongated current-carrying member and said piston means, said base means and said piston means defin-

ing a variable volume chamber whose interior is pressurized when said prime mover strokes said second member from its closed position to its opened position;

insulated plenum means, carried by said piston means and disposed around the contacting ends of said first member and said second member, for confining the fluid supplied by said piston means from said variable volume chamber in the vicinity of said gap until said arc is extinguished, said plenum means having a length at least equal to the length of the arc formed between said first and second members, whereby the interior of said outer enclosure adjacent said gap is shielded from the ionized fluid thereformed;

an arcing tip carried on said first elongated current-carrying member;

a second arcing tip carried on said second elongated current-carrying member; and,

wherein said first and second elongated current-carrying members carry both arcing current and steady state current.

4,841,109
SLIDE SWITCH

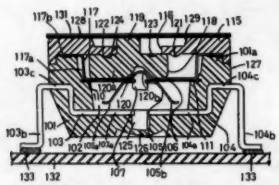
Takahiro Sakakino, Nagaokakyo; Koji Ohmori, Takatsuki; Takashi Yoshimura, Mishima; Shoji Kazusaka, and Yoshitaka Sunagawa, both of Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 27, 1987, Ser. No. 89,814

Claims priority, application Japan, Aug. 28, 1986, 61-132233; Dec. 24, 1986, 61-314084

Int. Cl.[4] H01H *15/02*

U.S. Cl. 200—302.1 **10 Claims**



1. A slide switch comprising:

a base member forming a housing;

an electrically insulating flexible film member housed within said base member;

a striking member mounted on one side of said film member and supported in said housing for sliding movement; and,

a switching contact mechanism housed within said base member on the other side of said film member and capable of being actuated by sliding movement of said striking member, said switch contact mechanism comprising:

a pair of spaced stationary contacts provided at a lower portion of said housing;

a movable contact blade having a mountain shape and a pair of contact portions at opposite ends of said blade for respectively engaging with said pair of spaced stationary contacts;

a spring plate member for supporting said movable contact blade within said housing at a position where said contact portions of said movable blade are both spaced from said pair of stationary contacts, said spring plate having a projection associated therewith for engaging with said striking member, said striking member having a profile which engages with said projection through said film upon sliding movement of said striking member to cause a deflection of said spring plate and the movement of the contact portions of said movable blade into respective engagement with said stationary contacts.

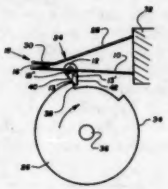
4,841,110
TIMING MECHANISM WITH CAM AND SWITCH ARRANGEMENT

Daniel K. Amonett, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 896,733, Aug. 15, 1986, abandoned. This application Aug. 27, 1987, Ser. No. 91,368

Int. Cl.[4] H01H *19/62*

U.S. Cl. 200—574 **6 Claims**



1. A timing mechanism comprising:

cam means rotatably mounted for providing a caming function, said cam means having at least one cam step;

switch means for providing a switching function, said switch means including a cam follower and means for providing a ramping function when said cam follower is raised over said step and for providing a quick break switching function, which is substantially quicker than that which would be provided by said ramping function, when said cam follower drops over said step, regardless of the direction of rotation of said cam means;

said means for providing a ramping function and a quick break switching function comprises:

a pivot means for pivoting said cam follower about a pivot axis; and means for limiting the amount of pivot of said cam follower;

said means for limiting the amount of pivot of said cam follower includes a ledge carried by said cam follower;

said switch means further comprises an electrical switch blade and said pivot means comprises a socket on said blade and a pin extending from said cam follower and engaging said socket;

wherein said ledge and said electrical switch blade contact each other to limit the pivot of said cam follower.

4,841,111
MICROWAVE OVEN WITH IMPROVED DEFROSTING MODE

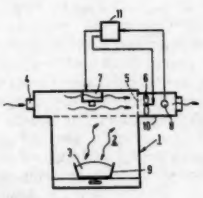
Franciscus Kokkeler, Malnate; Mario Fioroli, Brezzo di Bedero Varese, both of Italy; Per O. G. Risman, Herryda, Sweden; Liliana Vigano, Arese, Italy, and Mats G. Idebro, Norrköping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,605

Claims priority, application Sweden, Nov. 13, 1986, 8604868; Italy, Feb. 5, 1987, 19263 A/87

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 B **8 Claims**



1. A microwave oven capable of operating in a defrosting

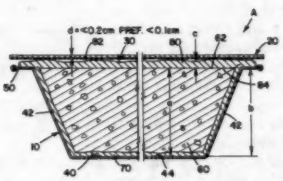
mode for defrosting a frozen article comprising an oven cavity in which a frozen article to be defrosted is placed, a microwave generator for radiating microwave energy into said cavity for heating said article, humidity sensor means for sensing a change in the humidity of the air in said cavity, fan means for producing an air flow across said article to said humidity sensor means, control means for controlling the duration of the generation of microwave energy into said cavity radiated from said microwave generator in accordance with the humidity sensed by said humidity sensor means, characterized in that, when said oven is in said defrosting mode, said control means determining the duration of the generation of energy from said microwave generator into said cavity and therefore the duration of the defrosting mode solely in accordance with the change in humidity sensed by said humidity sensor means, said change in humidity corresponding to a humidity gradient and interruption of the defrosting mode is effected when the humidity sensor means detects a predetermined positive humidity gradient.

4,841,112

METHOD AND APPLIANCE FOR COOKING A FROZEN POT PIE WITH MICROWAVE ENERGY

Yigal Peleg, Solon, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Feb. 1, 1988, Ser. No. 151,199
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **6 Claims**



1. A combined frozen pie and appliance for reconstituting the frozen pie in a microwave oven by direct exposure to microwave energy with said frozen pie being free of any transporting carton, said pie including a precooked, lossy material filler food having a preselected depth and covered by a layer of uncooked dough surrounding said filler food and having a top portion with a preselected nominal thickness between an upper undulating surface and a generally flat lower surface and said appliance comprising:

(a) as a first component, a dish shaped receptacle formed of a continuous sheet of metal foil material with a pie receiving cavity between a lower wall upon which said dough is supported and an upper peripheral rim with a preselected shape and spaced from said lower wall a distance slightly greater than said preselected depth and slightly less than the sum of said preselected depth and said preselected thickness whereby said filler food of said pie is within said cavity, but below said rim, and is shielded from direct microwave exposure by said metal foil, except for microwave energy passing through the top portion of said dough layer, whereby said undulating upper surface of said top portion is above said rim; and,

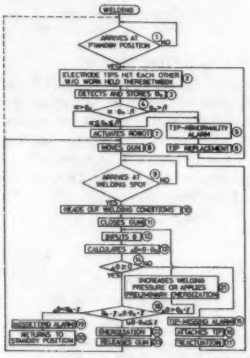
(b) as a second component, a self-sustaining generally rigid microwave susceptor sheet with an outer shape generally matching said preselected shape of said rim, said susceptor sheet supported directly on said upper surface of the top portion of said dough layer and in parallel, heat conduction relationship with said upper undulating surface but spaced from said rim by said top portion of said dough layer, said susceptor sheet including a thin metallized layer on a plastic film laminated to a paper board with a thickness less than 0.2 cm. with said layer having a thickness allowing microwave heating of said thin metal layer to brown said top surface into a browned, crisp crust by conduction to a temperature over 200° F. as said filler food is heated by only that microwave energy passing through said susceptor sheet and said top portion of said dough layer.

4,841,113

WELDING CONTROL APPARATUS AND METHOD

Akio Hamada; Gen Tsujii; Genzo Fuse, and Masahide Kondo, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,828
Claims priority, application Japan, Oct. 20, 1987, 62-262623; Oct. 20, 1987, 62-262625; Jan. 26, 1988, 63-13699
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—110 **6 Claims**



1. A welding control method for automatic welding machines wherein a welding gun is successively moved by a robot to a plurality of welding spots on a work object whereby the welding gun is closed to firmly clamp the work object while applying pressure thereto and energized to perform welding, said welding control method comprising the steps of:

closing the welding gun absent a work object clamped between the electrode tips prior to performing welding at a first welding spot on the work object for taking as a reference opening degree the then observed opening degree of the gun arms;

storing said reference opening degree;

presetting each welding spot at a specific opening degree of the gun arms which corresponds to the thickness of the work object at said welding spot;

detecting the opening degree of the gun arms when the welding gun is closed at each welding spot on the work object;

determining a difference between a detected opening degree and the reference opening degree; and thereafter

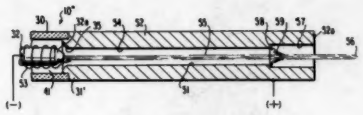
comparing said opening difference with said preset opening degree for checking of any abnormal conditions.

4. The welding control method as in claim 1, wherein the step of comparing said opening difference with said preset opening degree comprises the step of determining whether the opening difference is in the range above the preset opening degree in which case a preliminary energization using a smaller current than the welding current specified for each welding spot is applied until the opening difference is leveled off to the preset opening degree at which time the specified welding current is applied for regular welding.

4,841,114
HIGH-VELOCITY CONTROLLED-TEMPERATURE PLASMA SPRAY METHOD AND APPARATUS

James A. Browning, P.O. Box 6, Hanover, N.H. 03755

Continuation-in-part of Ser. No. 24,485, Mar. 11, 1987, Pat. No. 4,788,402. This application May 13, 1988, Ser. No. 193,702
Int. Cl.[4] B23K *9/00, 9/04*
U.S. Cl. 219—121.47 11 Claims



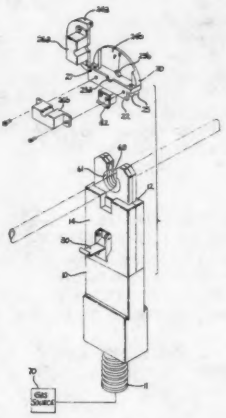
1. In a plasma-arc torch comprising a cylindrical casing forming a chamber and having a first, electrically conductive end wall including an extended length nozzle bore defining an anode nozzle passage extending axially therethrough and forming an anode electrode and a second, opposite end wall, a cathode electrode mounted coaxially within the opposite end wall of the cylindrical casing and being electrically insulated from said first end wall and terminating short thereof, said anode nozzle passage at its end facing said cathode electrode flaring outwardly and being conically enlarged, means for introducing a plasma producing gas under pressure into the chamber defined by said cylindrical casing, said cathode electrode and said end walls, and means for creating an electrical potential difference between said cathode electrode and said first end wall constituting said anode nozzle to create a plasma arc flame normally exiting from said anode nozzle passage, and with an anode foot normally constituted by a circumferential metal ring surrounding the nozzle exit orifice, the improvement comprising:

a surface discontinuity at a point along the nozzle bore, sufficiently upstream of said nozzle exit orifice and of sufficient size to cause the arc to pass to the anode nozzle passage wall in the vicinity of the discontinuity, thereby establishing an arc column which, with a downstream ionized region is maintained wholly within the extended length nozzle bore, thereby extending the life of the circumferential anode region, in the vicinity of the exit of the nozzle of the plasma torch while yielding full control over arc-length characteristics, wherein said means for introducing said plasma producing gas under pressure into said chamber comprises means for feeding said gas tangentially into the end of the chamber remote from said anode nozzle passage to establish a vortex flow of gas exhibiting a low pressure core extending through the anode nozzle passage and with said core establishing a small diameter arc column extending partially through said nozzle passage such that the boundary layer of the vortex flow of gas along the anode nozzle passage wall provides a path for the arc to pass directly to the anode nozzle passage wall at, or just downstream of the disturbance zone provided by the nozzle passage wall surface discontinuity, and further comprising means for introducing a material to be sprayed into a high-velocity, essentially ion-free hot gas stream downstream of the arc column and its downstream ionized region, at significantly lower temperature that of said arc column and its downstream ionized region, thereby eliminating excessive heating of the particles sprayed by the torch.

4,841,115
ORBITAL WELDHEAD

Joel C. Severin, Anaheim; Mark W. Scaglione, Huntington Beach; William S. Hinds, Costa Mesa, and Vytautas J. Jusionis, Westminister, all of Calif., assignors to ST International, Santa Ana, Calif.

Filed Feb. 25, 1988, Ser. No. 160,666
Int. Cl.[4] B23K *9/225*
U.S. Cl. 219—60 A 10 Claims



1. An apparatus for welding a joint in tubing comprising:

a weldhead;

a cartridge selectively attachable to said weldhead having collet means for gripping the tubing on either side of the joint to be welded;

a circular rotor disposed within said weldhead having a notch in the perimeter thereof to admit the tubing when said cartridge is attached to said weldhead;

an electrode disposed on an inner circumference of said circular rotor and extending radially therefrom;

drive means for rotating said rotor so that said electrode orbits the joint;

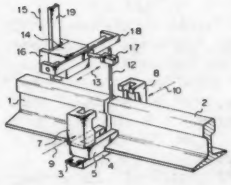
current supply means coupled to said electrode and the tubing for establishing a welding arc therebetween; and

pair of ceramic alumina inserts disposed in said weldhead, one on each side of the joint to be welded, for focusing the welding arc to the joint.

4,841,116
PROCESS FOR AUTOMATIC FUSION WELDING OF RAILS

Akira Kimura; Hiroshi Kashiwabara, and Hirohisa Fujiyama, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,254
Claims priority, application Japan, Feb. 24, 1987, 62-40779
Int. Cl.[4] B23K *25/00*
U.S. Cl. 219—73.1 1 Claim



1. A process for automatic fusion welding of rails by a com-

bination of submerged arc welding and electroslag welding, said rails having a base, a web, and a head, said process comprising:

performing an initial root weld run on the rail base using submerged arc welding and thereafter, without interruption of welding, performing subsequent weld runs on the rail base, followed by the rail web, and then the rail head using electroslag welding until completion of welding;

during all of said welding runs, preventing outflow of molten slag and molten metal by providing a metal mold mounted on an upper surface of the rail base and a metal shoe mounted on the metal mold;

performing all of said welding runs by using a DC welding power source providing a DC current and having constant potential characteristics, by using a filler wire having a diameter of form 1.2 to 2.0 mm, and by using a fused type flux comprising, as a main component, at least 15 to 45% of CaF_2 and 15 to 35% of TiO_2, wherein the total amount of CaF_2 and TiO_2 is at least 50%.

4,841,117

METHOD FOR LENGTHENING THE BLADING AEROFOIL OF TURBO MACHINERY BLADES

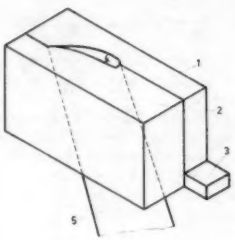
Tibor Koromzay, Wettingen, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 3, 1987, Ser. No. 128,170

Claims priority, application Switzerland, Dec. 12, 1986, 4952/86

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.1 **7 Claims**



1. A method for lengthening the blade aerofoil of turbo machine blades by building up weld metal thereon, the blade aerofoil having any given profile and the method being carried out on assembled blades, the method comprising the steps of:

encasing the portion of the blade aerofoil to be welded in a metal mold matched to the profile of the blade aerofoil and which metal mold extends beyond the end surface of the blade aerofoil thus forming a depression defined by the end surface of the blade aerofoil and the inside surfaces of the mold, the recess providing screening against air flowing into the mold, the end surface of the blade aerofoil being freely accessible; and

applying at least one layer of weld material to the end surface of the blade aerofoil.

4,841,118

ORBITAL WELD HEAD TOOL

Mark A. Overbay, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 28,997, Mar. 23, 1987, and a continuation-in-part of Ser. No. 55,280, May 28, 1987. This application Jun. 9, 1988, Ser. No. 205,399

Int. Cl.[4] B23K *9/225*

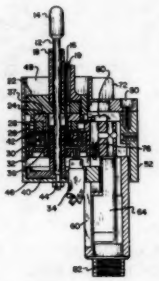
U.S. Cl. 219—124.03 **13 Claims**

1. An improved orbital weld head tool comprising in combination:

means for fixedly engaging the inside of a hollow workpiece and aligning and maintaining fixed positioning of said tool relative to the workpiece and the center of a desired substantially circular weld path thereon;

a tungsten weld tip supported on a carriage which moves longitudinally along said means for engaging, aligning and maintaining fixed positioning of said tool;

means rotating said carriage and thereby orbiting said tungsten weld tip in substantially said desired circular weld path about an axis through said center;



means to sense the changing voltage of said welding arc during orbiting of said weld tip; and

means for moving said means for oribting and said tungsten weld tip in a path parallel to said axis and toward and away from the workpiece in response to the magnitude of the voltage of said welding arc;

whereby variations in the workpiece weld path are accommodated to make a substantially uniform weld.

4,841,119

WELDING WIRE

Daniël Chambaere, Wevelgem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Nov. 24, 1987, Ser. No. 124,571

Claims priority, application Belgium, Dec. 19, 1986, 1/011594

Int. Cl.[4] B23K *35/22*

U.S. Cl. 219—146.1 **12 Claims**

1. Welding electrode for arc welding, comprising a steel substrate having a thin, ferrous oxide containing covering layer, wherein said covering layer has a thickness of less than 500 Å and has the structure of a ferric-oxide gel comprising trivalent Fe-cations that are surrounded by oxygen-containing anions, which anion-surrounded cations are amorphously bound in an aqueous gel-like network.

4,841,120

THERMAL HEAD

Masamori Yagino; Masato Taniguchi; Yoshitomo Ito; Toshimitsu Takano; Wataru Ishikawa; Sadatoshi Kikuchi, and Tetsuo Endo, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,269

Claims priority, application Japan, Sep. 12, 1986, 61-214078; Dec. 26, 1986, 61-316154; Feb. 28, 1987, 62-29143[U]

Int. Cl.[4] B41J *3/20*

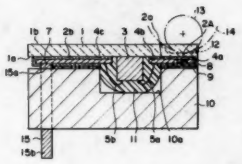
U.S. Cl. 219—216 **22 Claims**

1. A thermal head for recording on a recording medium comprising;

a substrate having a thick portion and a thin portion, said thin portion having a first flat surface and a second surface formed on an opposite side of said substrate from said first flat surface, said second surface being adapted to contact said recording medium,

a plurality of heat resistor elements formed on said first flat surface of said thin portion of said substrate,

wiring circuit means for said heat resistor elements formed on said first flat surface of said substrate and driving means



for driving said heat resistor elements formed by said first flat surface of said substrate,

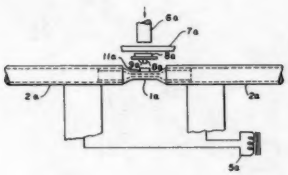
said thin portion being made by grinding said second surface of said substrate.

4,841,121

HOT HEADING PLASTIC RIVETS BY RESISTANCE HEATING

Edward A. Green, and Clayton S. Stambaugh, both of Warren, Ohio, assignors to The Taylor-Winfield Corporation, Warren, Ohio

Filed Jun. 18, 1987, Ser. No. 63,395
Int. Cl.[4] H05B *1/00*
U.S. Cl. 249—243 **4 Claims**



1. Resistance welding apparatus including at tube of high electrical resistance material brazed between two electrically conductive tubes connected to the secondary of a resistance welding transformer, a plastic element having a head projecting through a hole of a metallic element, and means for initiating forcible contact between said tube of high electrical resistance material and the head of said plastic element whereby the head of said plastic element is heated, softens and becomes upset to form an interlock, of the same material as said head, with said metallic element.

4,841,122

HUMIDIFIER HAVING A HEATING CHAMBER WITH A CONTINUOUSLY OPEN DRAIN AND FLUSHING OUTLET

Lewis Marton, Randwick, Australia, assignor to Atlas Air (Australia) Pty, Limited, New South Wales, Australia

Continuation of Ser. No. 706,265, Feb. 27, 1985, abandoned. This application Dec. 30, 1986, Ser. No. 948,408
Claims priority, application Australia, Mar. 2, 1984, PG 3893
Int. Cl.[4] H05B *1/02, 3/60;* F22B *1/30*
U.S. Cl. 219—273 **7 Claims**

1. A humidifier comprising:

(a) a heating chamber having side walls, a lid and a bottom defining a closed heating chamber, the bottom extending downwardly from the side walls and defining a single, continuously open drain and flushing outlet located at a lowermost extremity of the bottom so as to allow continuous flushing of impurities from the heating chamber;

(b) a water inlet in fluid communication with the heat chamber;

(c) a steam outlet located near the top of the heating chamber to allow steam to pass outwardly from the heating chamber;

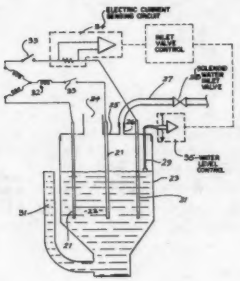
(d) port means defined by the heating chamber;

(e) electric water heating means located in the heating chamber and extending through the port means;

(f) electrical power supply means connected to the water heating means to supply electrical power thereto;

(g) an unobstructed open ended drain pipe having one open end in continuous open fluid communication with the drain and flushing outlet, the drain pipe extending up the outside of the heating chamber a predetermined height so that the other open end of the drain pipe defines a predetermined static water level inside the heating chamber;

(h) a water inlet valve adapted to control the flow of water passing through the water inlet into the heating chamber;



(i) means for detecting the water level in the heating chamber;

(j) inlet valve control means operatively connected to the water level detecting means and to the water inlet valve to open and close the valve to maintain the level of water within the heating chamber approximately equal to the height of the drain pipe; and,

(k) flushing control means comprising:

(i) means for detecting the impurity level of the water in the heating chamber; and,

(ii) means operatively connecting the inlet valve control means and said impurity level detecting means such that when the impurity level reaches a predetermined level the inlet valve control means opens the water inlet valve for a predetermined period of time to flush accumulated impurities out of the heating chamber through the drain and flushing outlet and the drain pipe.

4,841,123

AUTOMATIC WELDING DEVICE

Frank Novak, Chamblee, and Hartmut W. Fleiss, Marietta, both of Ga., assignors to Welding Services, Inc., Atlanta, Ga.

Filed Jun. 17, 1987, Ser. No. 63,270
Int. Cl.[4] B23K *11/32*
U.S. Cl. 219—125.12 **9 Claims**

1. An apparatus for positioning a welding torch to apply a weld overlay to a pre-existing along a substantially saddle-shaped juncture between a cylindrical workpiece and a substantially perpendicular intersecting pipe, comprising:

a carriage adapted to receive a welding torch for mounting to said carriage in fixed angular relation thereto;

a track selectively mountable to a workpiece for receiving said carriage for movement thereon, said track defining a pre-determined path substantially parallel to an imaginary surface defined by lines projecting radially outwardly along a path defined by a pre-existing weld, said track

further having a flat face formed longitudinally thereon, said face being in constant angular orientation with respect to said imaginary surface projecting radially said pre-existing weld and having a varying angular orientation with respect to horizontal, and said track further having a gear rack longitudinally mounted thereon;

a cylindrical roller mounted for rotation on said carriage in fixed angular relation thereto and disposed to engage said flat face of said track such that said roller engaging said flat face maintains said carriage in constant angular relation to said imaginary surface projecting normally from said pre-existing weld;

a gear mounted on said carriage for driven rotation such that said driven gear engages said gear rack to move said carriage along said track; and

means associated with said carriage for mounting said welding torch for movement toward and away from said workpiece in a direction normal to said workpiece and for translational movement across the width of said pre-existing weld.

4,841,124

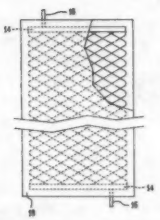
STRAIN-RESISTANT HEATED HELICOPTER ROTOR BLADE

Duncan B. Cox deceased, late of Pittsburgh, Pa. (Basil M. Cox, executor), and Martin Schuyler, Hastings-on-Hudson, N.Y., assignors to Cox & Company, Inc., New York, N.Y.

Continuation of Ser. No. 361,805, Mar. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 174,597, Aug. 1, 1980, abandoned. This application Apr. 27, 1987, Ser. No. 42,859

Int. Cl.[4] H05B *3/36*

U.S. Cl. 219—201 **4 Claims**



1. A strain-resistant heated helicopter rotor blade, comprising:

an elongated blade body having a longitudinal axis along which cyclic stress is applied during use;

an elongated electrical heater mounted to the body parallel to said axis and comprising a plurality of like, elongated and electrically resistive wires which are placed together to form a component with two opposed ends, two parallel sides and a central axis, each of said plurality of wires being oriented to substantially lie along directions of minimum strain in the blade body when the body is stressed along said longitudinal axis, said directions of minimum strain being determined by the Poisson's ratio of the blade body at the location of the heater and selected in accordance therewith; and

electrical terminals connected to said ends.

4,841,125

CONTROL UNIT FOR A HEATING SYSTEM WITH MEMORY MEANS

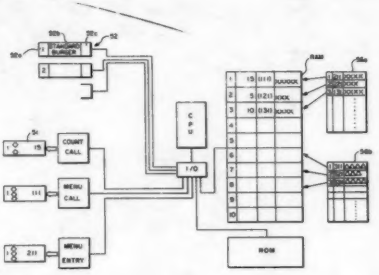
Kaoru Edamura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 80,221, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 875,588, Jun. 18, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 212,040

Claims priority, application Japan, Jul. 18, 1985, 60-110056[U]; Aug. 12, 1985, 60-124262[U]; Oct. 15, 1985, 60-1588441[U]; Dec. 12, 1985, 60-191706[U]

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—506 **18 Claims**



1. A control unit for a heating system comprising

a memory means having memory areas for storing data and cooking programs to be inputted thereto and outputted therefrom,

display means including a current program display window and a plurality of individual program display windows,

external memory means with memory modules for storing data to be loaded in said memory means,

control means serving to cause data stored in said memory means to be displayed by said display means,

program indicating means individually associated with said individual program display windows for specifying a program displayed in one of said individual program display windows,

menu entry means for causing said control means to store selected one or more of programs stored on said external memory,

means to be stored at specified one or more of said memory areas of said memory means,

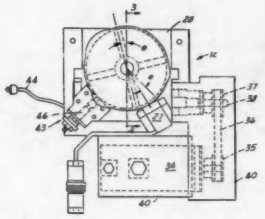
menu call means for causing data associated with a program stored in said memory means and specified by said program indicating means to be displayed in said current program display window, and

starting means for causing said control means to start executing a program stored in said memory means and specified by said program indicating means and to display in said current program display window data associated with said program.

4,841,126
ROTARY TABLE WIRE EDM MACHINE

Richard N. Graeber, Farmington Hills, Mich., assignor to McWilliams Machinery Sales, Division of Bridgeport Machines Inc., Farmington Hills, Mich.

Filed Dec. 28, 1987, Ser. No. 138,390
Int. Cl.[4] B23H *1/00, 11/00*
U.S. Cl. 219—69.2 **17 Claims**



10. In an EDM machine in which relative movement between at least one electrode of the EDM machine and a workpiece describe a path for producing a desired contour of a workpiece, the combination comprising:

translation means for providing a distance between the at least one electrode and an axis of rotation, the distance corresponding to the distance between a point on the path and the axis of rotation;

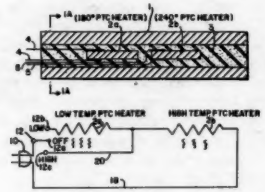
rotation means including a rotary table on which the workpiece is mountable for rotating the workpiece about the axis of rotation to an orientation in which the electrode is coincidental with the workpiece at a point on the path, said rotation means having a contact ring associated therewith; and

polarity means including a d.c. brush assembly for supplying polarity to the workpiece via said contact ring when the workpiece is mounted on the rotary table.

4,841,127
DUAL TEMPERATURE HAIR CURLER UTILIZING A PAIR OF PTC HEATERS

Lee A. Prager, Raymond, and Douglas C. Carbone, Standish, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 6, 1987, Ser. No. 34,516
Int. Cl.[4] H05B *1/02, 3/24;* H01C *7/02;* A45D *1/04*
U.S. Cl. 219—225 **7 Claims**



1. A heater device adapted to attain predetermined temperatures in high and low settings, said heater device comprising:

an elongated hollow body of heat transmitting material;

at least two PTC heaters having different anomoly temperatures disposed in said body, one of said PTC heaters having a higher anomoly temperature than the balance of said PTC heaters and means to conduct current to opposite sides of each of said PTC heaters;

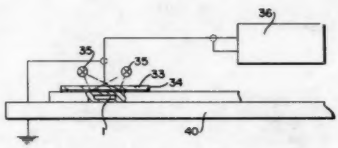
said current conducing means, including means electrically connecting said PTC heater in series with each other;

switch means including said PTC heaters connected to a power source through said current conducting means, said switch means cooperating with said current conducting means and said PTC heaters to produce a low temperature and a high temperature in said heater device by either (1) energizing the higher anomoly temperature heater in series with a lower anomoly temperature heater or (2) effectively energizing the higher anomoly temperature heater alone, said PTC heaters being arranged relative to each other and said current conducting means so that when a lower anomoly temperature PTC heater is energized, the higher anomoly temperature PTC heater in series therewith is simultaneously energized whereby the higher anomoly temperature PTC heater is limited in the temperature that it can attain by said lower anomoly temperature PTC heater.

4,841,128
CIRCUIT UNIT

Helmut Gröttrup, and Thomas Maurer, both of Munich, Fed. Rep. of Germany, assignors to Gesellschaft fur Automation u. Organization mbH, Munich, Fed. Rep. of Germany

PCT No. PCT/DE81/00008, § 371 Date Sep. 8, 1982, § 102(e) Date Sep. 8, 1982, PCT Pub. No. WO82/02444, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 8, 1981, Ser. No. 422,909
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—491 **33 Claims**



1. An apparatus comprising:

(a) an identification card

(b) a semiconductor substrate on said card

(c) an integrated circuit integrated on said substrate and adapted to process electronic signals; and

(d) a plurality of coupling elements coupled to said integrated integrated circuit, wherein said plurality of coupling elements comprises:

(i) opto-electronic means for transferring energy to said integrated circuit;

(ii) opto-electronic means means for transferring output data from said integrated circuit; and

(iii) opto-electronic means for transferring input data to said integrated circuit, wherein all of said coupling elements are integrated and disposed on said semiconductor substrate which bears said integrated circuit.

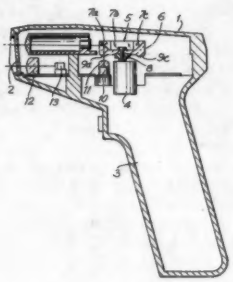
4,841,129
PATTERN RECOGNITION DEVICE

Takao Tawara, Kawaguchi; Jun Akedo, and Yoshiyuki Iwashita, both of Tokyo, all of Japan, assignors to Opticon Inc., Orangeburg, N.Y.

Filed Dec. 19, 1986, Ser. No. 944,375
Claims priority, application Japan, Dec. 21, 1985, 60-288859
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—472 **10 Claims**

5. A bar-code scanning device including a rotor rotatable about a fixed axis, and at least two mirrors carried by said rotor and positioned to provide sequential reflected scanning sweeps of a light beam directed towards said mirrors;

the improvement comprising each said mirror being formed integrally as a surface of an optical block rotatable about said fixed axis by a drive motor; and,



a lens associated with at least one of said mirrors and rotatable in unison therewith for modifying the focal point and depth of field of light beam when reflected by the associated said mirror.

4,841,130

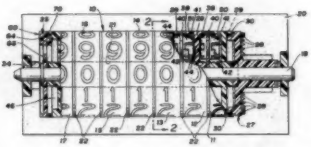
ODOMETER

Dale C. Maschino, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1988, Ser. No. 220,288

Int. Cl.[4] G01C *22/00*

U.S. Cl. 235—96 **3 Claims**



1. In an odometer assembly comprising a drive shaft, a plurality of digit wheels rotatably supported on said shaft, a plurality of carriers arranged between the respective wheels and coaxially mounted therewith on said shaft, means preventing said carriers from rotating, means drivingly connecting said drive shaft to a first one of said wheels, pinion gears rotatably supported on the respective carriers, said wheels having on one of two sides an internal ring and a pair of internal transfer teeth separated by a notch in said ring, said wheels having on the other side an internal ring gear, said pinion gears operable to transmit drive between adjacent ones of the wheels, said pinion gears having transfer teeth and locking teeth on one of two ends thereof that cooperate with said internal ring and said pair of teeth and said notch in the adjacent wheel to the right thereof and having drive teeth on the other end thereof that cooperate with said ring gear in the adjacent wheel to the left of said one wheel thereby to effect a ten to one reduction drive between each wheel and the immediate wheel to the left thereof and wherein the leftmost wheel is the highest indicating wheel, the improvement comprising an end disk mounted adjacent said leftmost wheel on said shaft, means preventing said end disk from rotating, and spring supported pawl means on said end disk for operatively engaging said pair of internal transfer teeth on said leftmost wheel as the latter said wheel is rotated in a forward direction to a zero indicating position to remove gear backlash initially and thereafter prevent backward rotation thereof.

4,841,131

PORTABLE ELECTRONIC DEVICE WITH MEANS FOR CHECKING DATA VALIDITY DURING READ-OUT

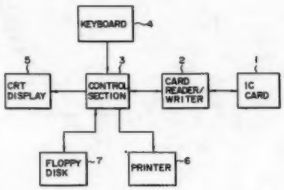
Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 7, 1987, Ser. No. 1,252

Claims priority, application Japan, Feb. 18, 1986, 61-33345

Int. Cl.[4] G06K *5/00*

U.S. Cl. 235—380 **7 Claims**



1. A data processing system including a portable electronic device and a host system detachably connected to said portable electronic device so as to transmit transaction data to the portable electronic device, said portable electronic device comprising:

means for receiving transaction data from said host system;

means for producing error detection information for said received transaction data;

mean for adding said produced error detection information to said transaction data; and

memory means for storing the transaction data to which the error detection information is added.

4,841,132

PROGRAM RECORDING SCHEDULING APPARATUS USING AN OPTICAL READER

Masahiko Kajitani, Neyagawa; Kiyoshi Takeda, Katano; Koji Isono, Neyagawa; Masumi Hirose, Kyoto; Kouji Matsubara, Moriguchi, and Etsuji Shuda, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 16, 1987, Ser. No. 74,552

Claims priority, application Japan, Jul. 21, 1986, 61-171266; Aug. 19, 1986, 61-194457; Aug. 19, 1986, 61-194458; Aug. 22, 1986, 61-197521; Aug. 26, 1986, 61-199643

Int. Cl.[4] G06K *7/10;* **G06F** *3/06*

U.S. Cl. 235—472 **11 Claims**

1. A program recording scheduling apparatus comprising:

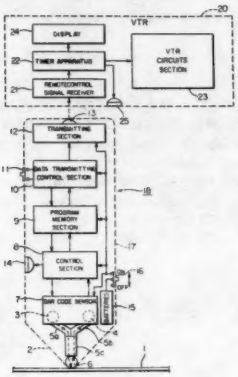
a bar code reading means for photoelectrically reading bar codes from a program member, said bar codes representing different kinds of program information for a particular program event including program date, channel number, start time and end time, said bar code reading means generating program scheduling signals which are a replica of photoelectrically detected bar codes corresponding to said different kinds of program information;

means for receiving said program scheduling signals from said bar code reading means and converting them into respective storable program signals corresponding to said different kinds of program information for a particular program event, said respective storable program signal omitting preselected information which is contained in corresponding program scheduling signals;

program memory means containing a plurality of storage areas, said plurality of storage areas respectively storing the storable program signals corresponding to said different kinds of program information for a particular program event in response to signals from a control means;

transmitting means for converting the storable program signals stored in said memory means into a transmitted infrared remote control signal; and

data transmitting control means responsive to an applied actuating signal for collectively transmitting said storable program signals corresponding to said different kinds of



program information for a particular program event from said program memory means to said transmitting means for conversion into said transmitted infrared control signal.

4,841,133

DATA CARD CIRCUITS

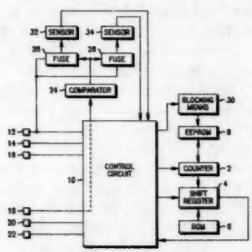
Anil Gercekci, Geneva; Michel Bron, Lausanne, both of Switzerland, and Peter D. Hudson, Camberley, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1988, Ser. No. 175,390

Claims priority, application United Kingdom, Jun. 30, 1987, 8715268

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—492 **19 Claims**



1. A data card of the type comprising an integrated circuit on a semiconductor chip embedded in a plastic card, the circuit including a non-volatile memory having a transport code preprogrmamed therein, control circuitry for controlling the circuit, a comparator having a first input coupled to an input node of the circuit for receiving an externally-applied code and a second input coupled to said memory for comparing said externally-applied and transport codes, and a first irreversible switch coupled to an output of the comparator such that said first irreversible switch is actuated if the externally-applied and transport codes match.

4,841,134

IC CARD

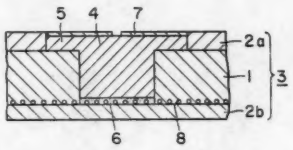
Yoshiaki Hida; Satoshi Ishihara; Seiji Take; Masao Gogami, and Toshiyuki Suzuki, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushika Kaisha, Tokyo, Japan

Filed Jul. 25, 1986, Ser. No. 889,277

Claims priority, application Japan, Jul. 27, 1985, 60-166450; Sep. 5, 1985, 60-196168; Nov. 8, 1985, 60-250152; Feb. 21, 1986, 61-036719; Mar. 4, 1986, 61-047023

Int. Cl.[4] G06K *19/02*

U.S. Cl. 235—488 **22 Claims**



1. An IC card comprising an IC module embedded in an IC module substrate built in a card substrate, said IC module comprising an IC chip, a circuit substrate and a reinforcing member, said reinforcing member comprising at least a part of the side portion of said IC module substrate extended in the outer circumferential direction, wherein said reinforcing member is formed in a shape so that it has a greater area toward the portion of the IC card with a greater flex coefficient.

4,841,135

ROTARY LIGHT BEAM DEFLECTOR WITH REVOLUTION SURFACE MIRROR

Chiaki Goto, and Kazuo Horikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 938,298, Dec. 5, 1986. This application Aug. 23, 1988, Ser. No. 235,131

Claims priority, application Japan, Dec. 5, 1985, 60-272399; Feb. 7, 1986, 61-23950; Feb. 10, 1986, 61-25938

Int. Cl.[4] G01J *3/50*

U.S. Cl. 350—6.8 **1 Claim**

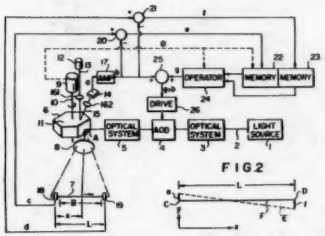


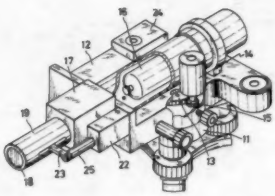
FIG 2

1. A light beam deflector comprising a deflecting surface which rotates about a rotational shaft to deflect a scanning light beam and a revolution surface mirror having a reflecting surface which is a surface of revolution coaxial with the rotational shaft, the revolution surface mirror being formed integrally with the rotational shaft.

4,841,136
SIGHTING APPARATUS WITH AUTOMATIC CORRECTION MECHANISM

Yasuyuki Nakayama, and Tomoya Sada, both of Chofu, Japan, assignors to Mizoguchi Manufacturing Company Limited, Aichi, Japan

Filed Dec. 15, 1987, Ser. No. 133,275
Claims priority, application Japan, Dec. 18, 1986, 61-195120[U]
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 R 3 Claims

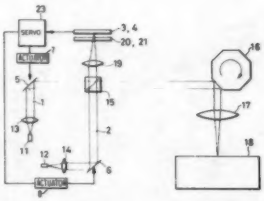


1. A sighting apparatus comprising a table provided rotatably on a base, and a laser oscillator an optical system including an automatic correction mechanism being mounted on the table, the table being rotated by remote control, characterized by a circular air bubble tube provided on the table such that an air bubble is positioning at the center of the tube when the table is in a horizontal state, a photosensor disposed on the table for sensing the position of the air bubble in the tube, and an interruption circuit provided on the table for interrupting a power source for the laser oscillator in accordance with a signal from the photosensor which is generated when the table is tilted beyond an angle range in which the automatic correction mechanism operates effectively.

4,841,137
BEAM POSITION CONTROL DEVICE

Takeshi Mochizuki, Ibaragi; Akira Arimoto, and Susumu Saito, both of Tokyo, all of Japan, assignors to Hitachi Koki Company, Limited and Hitachi, Ltd., both of, Japan

Filed Jul. 2, 1987, Ser. No. 69,122
Claims priority, application Japan, Jul. 4, 1986, 61-156079
Int. Cl.[4] H01J 3/14; H04N 1/10
U.S. Cl. 250—236 12 Claims

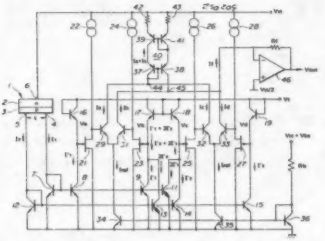


1. A beam deflecting device, comprising:
two light sources for providing first and a second light beam;
a deflector;
a recording medium;
a beam splitter for splitting said first and second light beams into a first and a second scanning light beam respectively incident upon said deflector for scanning said recording medium, and a first and a second reference light beam respectively;
a light detector having a first and a second beam position detector which are contained in the same plane; and
separating means positioned between said beam splitter and said first and second beam position detectors for separating said first and second reference light beams to fall respectively upon said first and second beam position detectors.

4,841,138
PHOTOSENSITIVE POSITION SENSOR WITH LOGARITHMIC CONVERSION

Hideo Muro, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 28, 1987, Ser. No. 90,603
Claims priority, application Japan, Aug. 28, 1986, 61-200200; Aug. 28, 1986, 61-200201
Int. Cl.[4] H01J 40/14
U.S. Cl. 250—209 17 Claims



1. A position sensor comprising;
a photosensitive element comprising a first semiconductor layer of a first conductivity type which forms a photosensitive pn junction with a second semiconductor layer of a second conductivity type, and first and second electrodes connected to first and second separate positions of said first layer, respectively, for delivering first and second photocurrents which vary in dependence on a position of a spot illuminated by a beam of light between said first and second positions,
current converting means for receiving said first and second photocurrents from said photosensitive element, and producing a first detection current corresponding to said first photocurrent, a second detection current corresponding to said second photocurrent, a first sum current which is a sum of said first detection current and twice said second detection current, and a second sum current which is a sum of said second detection current and twice said first detection current,
logarithmic converting means for producing a first logarithmic voltage which is in a logarithmic relationship with said first detection current, a second logarithmic voltage which is in a logarithmic relationship with said first sum current, a third logarithmic voltage which is in a logarithmic relationship with said second sum current, and a fourth logarithmic voltage which is in a logarithmic relationship with said second detection current,
a first differential pair circuit for amplifying a difference between said first and second logarithmic voltages, and producing first and second differential output currents,
a second differential pair circuit for amplifying a difference between said third and fourth logarithmic voltages, and producing third and fourth differential output currents, and
operating means for producing a position signal representing the position of the illuminated spot from said first, second, third and fourth differential output currents.

4,841,139
METHOD FOR TESTING COMPONENTS OF TRANSPARENT MATERIAL FOR SURFACE IRREGULARITIES AND OCCLUSIONS

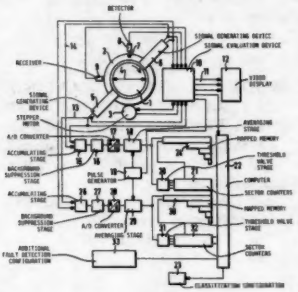
Harald Schmalfuss, Rodgau; Hubert Kurpiella, Eschborn, and Bernhard Schneider, Hofheim, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,181

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620146

Int. Cl.[4] G01N *9/04*

U.S. Cl. 250—223 R **10 Claims**



1. A method for testing components of transparent material for surface irregularities and occlusions, comprising the steps of:

dot-scanning the component by moving a light ray which produces a light section in the component as the light ray passes completely therethrough;

detecting the light which respresents surface irregularities and occlusions of at least the front and back surfaces of the component by receivers located on one side of the component;

generating fault signals based on the light detected in said detecting step;

digitizing the fault signals which are generated in said generating step;

feeding the digitized signal to a mapped memory; and analyzing the signal by:

(a) feeding the digitized signal through a preselectable number of thresholds to a number of sector counters;

(b) evaluating the sector counters on-line according to preselected criterion regarding the number, location and gray tone distribution of the digitized fault signals; and

(c) evaluating the signals in the mapped memory in a computer if the fulfillment of the criterion for evaluation of the sector counters cannot be sufficiently assured.

4,841,140
REAL-TIME COLOR COMPARATOR

Charles T. Sullivan, and J. David Zook, both of Burnsville, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 9, 1987, Ser. No. 118,587

Int. Cl.[4] G01J *3/50*

U.S. Cl. 250—226 **9 Claims**

1. Input mechanism to a color comparator apparatus comprising:

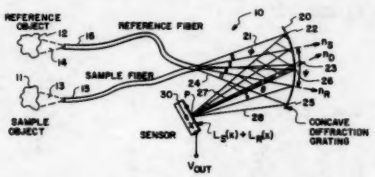
first optical path means having an input end and an output end, said input end being adapted to collect and transmit the color of a reference object to said output end;

second optical path means having an input end and an output end, said input end being adapted to collect and transmit the color of a sample object to said output end;

spectral dispersive element means in the form of a single concave diffraction grating, said grating including a reference area and a sample area which are spatially separated one from the other on said concave diffraction grating;

means positioning said first optical path means output end to direct reference light emanating therefrom to the reference area on said concave diffraction grating;

means positioning said second optical path means output end to direct sample light emanating therefrom to the sample area on said concave diffraction grating;



a photodetector array, said photodetector array having a reference linear array of photodetectors and adjacent thereto a sample linear array of photodetectors;

means directing diffracted light from said reference area onto said reference linear array of photodetectors from a first solid angle and directing diffracted light from said sample area onto said sample linear array of photodetectors from a different solid angle, said reference array and sample array of photodetectors producing a plurality of light intensity signals representative of the spectral distribution of the reference object color and the sample object color.

4,841,141
OPTICAL COORDINATES INPUTTING APPARATUS HAVING SWITCHING MEANS TO OPERATE Y-AXIS LIGHT EMITTERS WHEN OPERATION OF THE X-AXIS EMITTERS OUTPUTS A COORDINATES SIGNAL

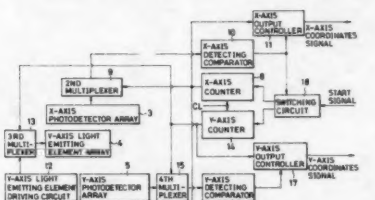
Junichi Ouchi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 13, 1988, Ser. No. 206,455

Claims priority, application Japan, Sep. 7, 1987, 62-223769

Int. Cl.[4] G01V *9/04;* **G06M** *7/00;* **H01J** *40/14*

U.S. Cl. 250—221 **2 Claims**



1. An optical coordinates inputting apparatus comprising a light emitting element array and a photodetector array opposed to the light emitting element array, arranged in X- and Y-axis directions, X-axis and Y-axis multiplexer means sequentially driven as a pair of light emitting element and photodetector of the X- and Y-axis directions, X- and Y-axis signal detecting means for outputting a coordinates signal when a light

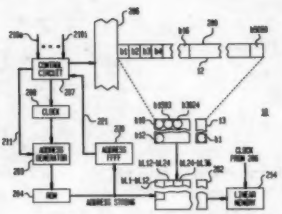
signal outputted from the driven light emitting element is not photodetected by the opposed photodetector, and switching means for operating either the X-axis or Y-axis multiplexer means, whereby, when the coordinates signal is outputted, the switching means operates the other X- or Y-axis multiplexer means.

4,841,142

DOCUMENT SCANNER WITH RESOLUTION SELECTION CONTROL

Paul Waszkiewicz, Agoura Hills, Calif., assignor to Photon Devices, Ltd., Newport Beach, Calif.

Filed Nov. 3, 1987, Ser. No. 116,517
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **8 Claims**



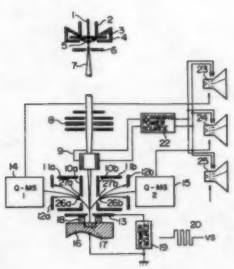
1. A scanner including a plurality of radiation conduits configured to define an entrance field and an exit field having first and second geometries, respectively, an array of discrete sensors energy-coupled to said plurality of conduits at said exit field, and circuit means connected to said sensor array, said circuit means being adapted to store those outputs from said sensor array which are located at addresses in one of a plurality of address strings which is a subset of the totality of addresses in said array, said circuit means including means for selecting one of said plurality of address strings.

4,841,143

CHARGED PARTICLE BEAM APPARATUS

Hifumi Tamura, Hachioji; Hiroyasu Shichi, and Kaoru Umemura, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,408
Claims priority, application Japan, Feb. 27, 1987, 62-42551
Int. Cl.[4] H01J *37/256*
U.S. Cl. 250—288 **8 Claims**



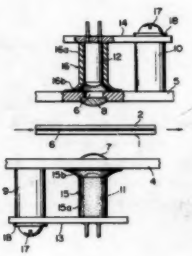
1. A charged particle beam apparatus comprising:
hybrid charged particle beam source means for emitting a charged particle beam formed of both ions and electrons;
focusing means for focusing and for enabling irradiation of said charged particle beam emitted by said charged particle beam source means on a sample;
deflecting means for deflecting said charged particle beam so as to scan said sample;
secondary ion separating means disposed approximately symmetrically with respect to the axis of said charged particle beam proximate to said sample for separating positive and negative secondary ions generated by the irradiation of said sample into positive and negative ions;
two mass analyzers for analyzing the mass of said separated positive and negative secondary ions, respectively;
magnetic field generating means for extracting secondary electrons in a direction perpendicular to the direction, along which said secondary ions are extracted; and
a secondary electron detector for detecting secondary electrons thus extracted.

4,841,144

DUST-PROOF TUBE HAVING A CYLINDRICAL PORTION THAT SEALS PHOTOSENSOR AND INTEGRALLY FORMED FRUSTRUM PORTION

Kouichi Goi, Kawasaki; Hiroshi Emori, Koshigaya, and Daiki Sato, Tokyo, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,769
Claims priority, application Japan, Feb. 27, 1987, 62-29813[U]
Int. Cl.[4] H01J *5/02*
U.S. Cl. 250—239 **13 Claims**



1. A dust-proof tube for a photosensor comprising a cylindrical portion, the inner diameter of said cylindrical portion being substantially equal to the outer diameter of said photosensor so that said cylindrical portion can sealingly receive said photosensor, and a frustum portion integrally formed with said cylindrical portion and extending from an end of said cylindrical portion, said cylindrical portion and said frustum portion being made of elastic material.

4,841,145

APPARATUS FOR PREPARING SAMPLE SOLUTION FOR INFRARED SPECTROPHOTOMETER AND METHOD OF ANALYZING SAMPLE SOLUTION

Akio Wada, Hachioji; Fumiko Nakeuchi, Kokubunji, and Seiji Nishizawa, Tokyo, all of Japan, assignors to Nihon Bunko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,908
Claims priority, application Japan, Jun. 24, 1986, 61-147393
Int. Cl.[4] G01J *3/42;* **G01N** *21/35*
U.S. Cl. 250—304 **14 Claims**

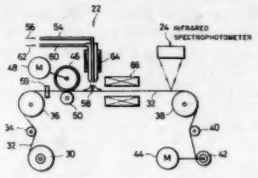
1. An apparatus for measuring the infrared spectrum of a component separated by a liquid chromatograph, comprising:
sample retaining means having a surface made of a substance which reflects infrared radiation, a recessed portion being formed on said surface;
a dropping tube, having an end portion disposed above said sample retaining means, for receiving effluent from a

column of a liquid chromatograph, and through which said effluent flows as a sample solution and from which said sample solution is allowed to drip into said recessed portion of said sample retaining means;

driving means for driving said sample retaining means continuously or intermittently;

solvent removing means for depositing a solute of said sample solution dripped in said recessed portion of said sample retaining means by evaporating a solvent of said sample solution; and

an infrared spectrophotometer which emits infrared radiation onto the deposited solute and measures the intensity of the infrared radiation which is absorbed by said solute and reflected back through said deposited solute by a bottom surface of said recessed portion.

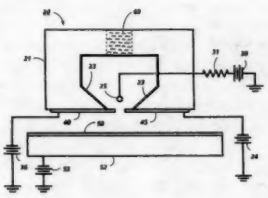


4,841,146

SELF-CLEANING SCOROTRON WITH FOCUSED ION BEAM

Robert W. Gundlach, Victor, and Richard F. Bergen, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1987, Ser. No. 81,068
Int. Cl.[4] H01T *19/04*
U.S. Cl. 250—324 **7 Claims**



1. A self-cleaning scorotron charging apparatus adapted to uniformly charge a surface of a charge receptor substrate with either negative or positive ions, said charging apparatus being characterized by including:

a substantially enclosed insulating housing including top, side and bottom, surfaces;

electrode means positioned on said bottom surface of said insulating housing and adapted to form a slit therein, and

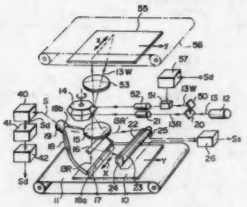
coronode means within said insulating housing adapted to emit ions through said slit onto said charge receptor, said insulating housing having wedge shaped interior portions that are slanted toward said slit so as to focus additional ions from said coronode means to the center of said slit and thereby increase the efficiency of said charging apparatus.

4,841,147

IMAGE READ-OUT AND RECORDING APPARATUS

Shigeru Saotome, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 30, 1987, Ser. No. 67,854
Claims priority, application Japan, Jun. 30, 1986, 61-153566
Int. Cl.[4] G01N *23/04*; H04N *1/04*
U.S. Cl. 250—327.2 **4 Claims**



1. An image read-out and recording apparatus comprising:

(i) a light source for emitting a light beam,

(ii) a light beam splitting means for splitting said light beam into a read-out beam and a recording beam,

(iii) a common light deflector for deflecting said read-out beam and said recording beam to produce a deflected read-out beam and a deflected recording beam, respectively,

(iv) a read-out sub-scanning means for moving an image original, which is disposed at a position at which the deflected read-out beam impinges, with respect to said light deflector in a direction at an angle with respect to a direction of main scanning effected by said deflected read-out beam,

(v) a light detection means for photoelectrically detecting light reflected by said image original, light passing through said image original, or light emitted by said image original when said image original is exposed to said read-out beam, and generating image signals representing an image recorded on said image original,

(vi) a modulation means for modulating said recording beam on the basis of said image signals, and

(vii) a recording sub-scanning means for moving a photosensitive material, which is disposed at a position at which the deflected recording beam impinges, with respect to said light deflector in a direction at an angle with respect to the direction of main scanning effected by said deflected read-out beam,

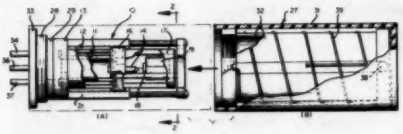
wherein said apparatus further comprises means for forming an additional beam from said deflected read-out beam by splitting said deflected read-out beam, and a means for detecting the amount of said additional beam for generating a synchronizing signal representing a scanning position of said deflected read-out beam on said image original with respect to said main scanning direction.

2. An apparatus as defined in claim 1 wherein said image original is a stimulable phosphor sheet carrying a radiation image stored thereon, and said light detection means detects light emitted by said stimulable phosphor sheet in proportion to the stored radiation energy upon exposure to stimulating rays as said read-out beam.

4,841,148
VARIABLE TEMPERATURE SCANNING TUNNELING MICROSCOPE

Joseph W. Lyding, Champaign, Ill., assignor to The Board of Trustees of The University of Illinois, Urbana, Ill.

Filed Mar. 21, 1988, Ser. No. 170,732
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—306 **6 Claims**

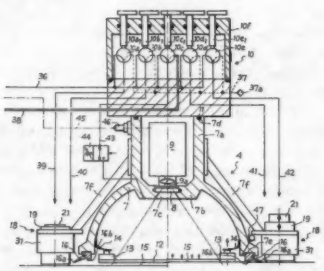


1. A scanning, tunneling microscope comprising:
a base;
an inner and an outer piezoelectric tube concentrically connected to said base, said tubes having substantially the same length and the same composition;
a tunneling probe having a tip, said probe being coaxially connected to an end of said inner piezoelectric tube opposite said base;
a temperature compensating annular collar coaxially connected to an end of said outer piezoelectric tube opposite said base, said collar having a length and composition to compensate for thermal changes in the length of said probe;
a sample holder tube axially connected to said collar;
a pair of spaced rails extending longitudinally within said holder tube and attached thereto;
a holder for holding a sample to be examined, said holder resting on and movable along the length of said rails;
conductor means for applying selected voltages to said outer piezoelectric tube to cause inertial movement of said sample along said rails to a distance within tunneling range from said tip of said probe; and
conductor means for applying selected voltages to said inner piezoelectric tube to cause said probe to scan a portion of a surface of said sample.

4,841,149
DEVICE FOR DETECTING MICRO-LEAKS OF GAS BY INFRARED RADIATIONS

André Martin, Toulon, and Minh P. Luong, Montgeron, both of France, assignors to Technologies Speciales Ingenierie-T.S.I., Toulon, France

Filed Mar. 1, 1988, Ser. No. 162,816
Claims priority, application France, Mar. 6, 1987, 87 03212
Int. Cl.[4] G01M *3/38*
U.S. Cl. 250—330 **12 Claims**

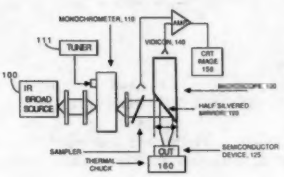


1. Device for detecting micro-leaks of gas by infrared radiations on a wall, of the type comprising an enclosure provided with an infrared camera and further provided with an opening equipped with sealing means designed to be placed in contact with the wall, means for sealingly applying said enclosure against said wall and means for creating a partial vacuum inside said enclosure, device wherein said infrared camera is placed inside a sealed tank separated from the enclosure by a partition wall, and has its objective situated in front of a lens permeable to infrared radiations and fixed in said partition wall, and has its comprising an insulating screen placed in the center of the opening of the enclosure and applied against said wall for filtering the gas leaks drawn by the effect of the vacuum, as so to obtain a thermal gradient detectable by thermovision.

4,841,150
REFLECTION TECHNIQUE FOR THERMAL MAPPING OF SEMICONDUCTORS

Martin J. Walter, Lee, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 28, 1987, Ser. No. 138,238
Int. Cl.[4] G01K *11/18, 13/00*
U.S. Cl. 250—339 **2 Claims**

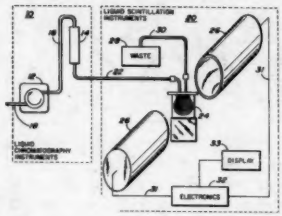


2. A device for determining a semiconductor's actual temperature comprising:
an infrared source which emits a broad spectrum of light;
a tunable monochrometer which receives said broad spectrum of light from said infrared source and produces therefrom an illuminating monochromatic radiation at tunable wavelengths, said illuminating monochromatic radiation being reflected off of said semiconductor, said tunable monochrometer also indicating to users a value of the illuminating monochromatic radiation's wavelength actually being emitted;
a microscope which receives light reflected off of said semiconductor from said illuminating source to produce an image of said semiconductor;
a detector which receives and converts said image of said semiconductor from said microscope and converts said image into electrical signals; and
a display means which receives said electrical signals from said detector and displays said semiconductor image as said tunable monochrometer is incrementally tuned, said display means indicating a decrease of light reflected off of said semiconductor at a transition point where said illuminating monochromatic radiation is transmitted through the semiconductor rather than reflected off of it, said transition point occuring at a specific wavelength which corresponds to the semiconductor's actual band gap energy and actual temperature, said specific wavelength being the value of the monochromatic radiation's wavelength actually emitted by the tunable monochrometer at the transition point.

4,841,151
VARIABLE VOLUME FLOW CELL

William H. Shope, Santa Ana, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 13, 1987, Ser. No. 14,738
Int. Cl.[4] G01T 1/20; G01N 23/12
U.S. Cl. 250—364 10 Claims

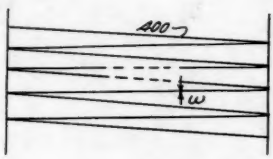


8. A variable volume flow cell for a continuous flow liquid scintillation instrument comprising a rotatable spool wound with a selectable length of transparent open-bored flexible tubing, the number of windings of the tubing being variable according to the desired volume of flow in proximity to a light detector, the wound open-bored tubing being rotatably held within a frame and enclosed within a cover, said flow cell being positioned within a liquid scintillation instrument in proximity to the light detector for transmitting light energy from a sample solution with scintillation material through said tubing to said light detector.

4,841,152
CONTINUOUS-RESISTANCE FIELD SHAPING ELEMENT FOR A KINESTATIC CHARGE DETECTOR

Frank A. DiBianca, Chapel Hill, N.C., assignor to University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Filed May 13, 1988, Ser. No. 193,526
Int. Cl.[4] G01T 1/185
U.S. Cl. 250—374 8 Claims



1. An apparatus for detecting the spatial distribution and intensity of radiation, comprising:

a first means for conducting electrical current;

a second means for conducting electrical current;

means for fixing the position of said second conducting means with respect to said first conducting means to define a gap therebetween, said fixing means comprises an enclosure including first and second opposing walls and a third wall attached to said first and second walls, said first conducting means disposed on said first wall, said second conducting means disposed on said second wall;

radiation source means for directing ionizing radiation into said gap;

medium means, disposed within said gap, for ionizing in response to said radiation to produce charge carriers;

charge carrier displacing means, electrically connected to said first and second conducting means, for inducing the charge carriers within said gap to drift at a velocity v_{drift} in a first direction, said charge carrier displacing means including means for producing a uniform constant electric field between said first and second conducting means;

moving means, coupled to at least one of said source means and said medium means, for moving said medium means relative to said source means in a second direction opposite to said first direction at a velocity v_{scan} having a magnitude substantially equal to the magnitude of the velocity v_{drift} of said drifting charge carriers;

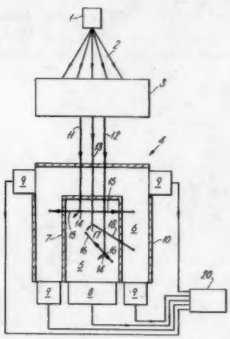
detecting means for detecting charge carriers in said gap; and

correcting means disposed on a first surface of said third wall within said enclosure, for correcting distortions in said electric field in proximity to said third wall first surface, said correcting means comprising a resistive wire zig-zagged across said third wall first surface and electrically connected between said first and second conducting means.

4,841,153
COAL ANALYSIS

Malcolm R. Wormald, Abingdon, England, assignor to Cogent Limited, London, England

Continuation of Ser. No. 908,720, Sep. 18, 1986, abandoned. This application Jul. 27, 1988, Ser. No. 225,623
Claims priority, application United Kingdom, Sep. 18, 1985, 8523060
Int. Cl.[4] G01T 3/06; G01N 23/222
U.S. Cl. 250—390.04 9 Claims



1. A gamma ray detector system comprising:

a plurality of scintillators for detecting gamma rays as detection events and generating outputs corresponding to said detection events, said scintillators being arranged adjacent each other in an array; means for detecting one of said outputs from any of said scintillators, and for selecting the scintillator corresponding to that output as a primary scintillator;

means for selecting two other scintillators of said plurality of scintillators on opposite sides of said primary scintillator; and

means for detecting outputs from said two other scintillators which are coincident with said one of said outputs from said primary scintillator.

7. A method of analyzing a material which generates gamma rays when subjected to neutrons, said method comprising:

subjecting said material at a site to first neutrons from a first neutron source of first properties:

detecting first gamma rays generated from said material, when said material is subjected to said first neutrons, by prompt neutron activation substantially at the site at which said material is subjected to said first neutrons, so as to generate first gamma ray detection events correspond-

ing to said first gamma rays detected, and generating first outputs corresponding to said first gamma ray detection events;

determining from said first outputs energies of the first gamma rays corresponding to said first outputs;

generating a first energy spectrum of the energies of the first gamma rays corresponding to said first outputs;

subjecting the material at a site to a second neutrons from a second neutron source of second properties;

detecting second gamma rays generated from said material when said material is subjected to said second neutrons, by prompt neutron activation substantially at the site at which said material is subjected to said second neutrons, so as to generate second gamma ray detection events corresponding to said second gamma rays detected, and generating second outputs corresponding to said second gamma ray detection events;

determining from said second outputs energies of the second gamma rays corresponding to the second outputs;

generating a second energy spectrum of the second gamma rays corresponding to said second outputs; and

comparing said first and second energy spectra so as to determine the composition of said material.

4,841,154

THERMAL COPYING APPARATUS

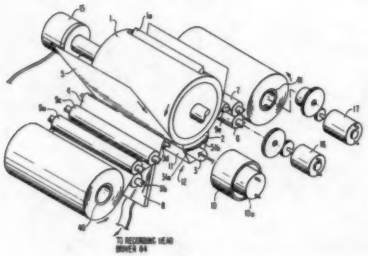
Masanori Yoshikawa, Mino, and Shuichi Watanabe, Yahata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 10, 1987, Ser. No. 60,358

Claims priority, application Japan, Jul. 18, 1986, 61-170054; Nov. 10, 1986, 61-266890; Nov. 10, 1986, 61-266924

Int. Cl.[4] G03C *5/16*

U.S. Cl. 250—317.1 **15 Claims**



1. A thermal copying apparatus comprising:

a holding member and a transparent member for holding therebetween an original having thereon an image pattern corresponding to which heat is accumulated when said original is irradiated by a light and a recording sheet so that said original and said recording sheet are in intimate contact with each other at a predetermined area;

a conveying means for conveying said original and said recording sheet;

a light source for producing a light for irradiating said original through said transparent member each time when said original and said recording sheet are conveyed by a predetermined distance to effect a copying operation in which said original accumulates heat in a pattern corresponding to said image pattern so that said image pattern is thermosensitively copied on said recording sheet; and

a temperature control means for making a surface temperature of said transparent member uniform during the copying operation by at least one of heating and cooling.

4,841,155

INDICATOR ARRANGEMENT FOR MOTOR VEHICLES

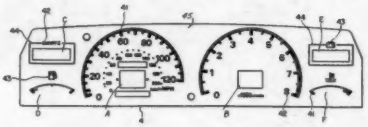
Masahiko Ushida, and Hitoshi Shibata, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 28, 1987, Ser. No. 55,132

Claims priority, application Japan, May 30, 1986, 61-126548

Int. Cl.[4] G09F *13/20*

U.S. Cl. 250—463.1 **5 Claims**



1. An indication device of a gauging apparatus, comprising:

an indication panel having with a background portion and indication marks including patterns and characters; and

a black light source for illuminating the surface of said indicator panel, said black light source being capable of exciting a fluorescent material, said black light source being positioned so as to direclty illuminate the surface of said panel,

wherein said background portion of said indicator panel surface is printed with a fluorescent-material-containing paint which has a first color when exposed to light from said black light source and a second color when exposed to ordinary light unable to excite the fluorescent material.

4,841,156

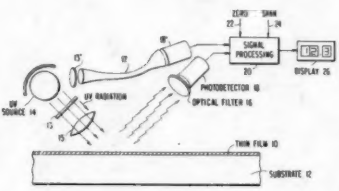
MEASUREMENT OF THE THICKNESS OF THIN FILMS

Joe T. May, and Edward A. Casacia, both of Leesburg, Va., assignors to Electronic Instrumentation and Technology, Inc., Sterling, Va.

Filed May 15, 1987, Ser. No. 49,833

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—461.1 **8 Claims**



1. A method of selectively measuring the thickness of a film or a film on a substrate comprising the steps of:

exciting the film with ultraviolet radiation of first wavelengths selected based on the florescence characteristics of the material of the film to cause the film to fluoresce by emitting light of a longer ultraviolet wavelength than the exciting radiation;

detecting the ultraviolet radiation of said first selected wavelengths to produce a first electrical signal proportional to an instantaneous intensity of said ultraviolet radiation of said first selected wavelengths;

filtering and detecting the emitted light from the film to produce a second electrical signal proportional to second selected wavelengths of the emitted light;

dividing said second electrical signal by said first electrical signal to produce an instantaneous quotient output calibrated to the intensity of the exciting radiation and which is a direct measurement of the thickness of the film; and

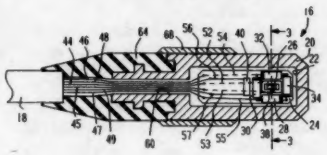
displaying the calibrated output.

4,841,157

OPTICAL BACKSCATTER TURBIDIMETER SENSOR

John P. Downing, Jr., 2428 39th Street, N.W., Washington, D.C. 20007

Filed Jan. 6, 1988, Ser. No. 141,268
Int. Cl.[4] G01N *15/07, 21/49*
U.S. Cl. 250—574 13 Claims



1. An apparatus for measuring particle concentration in fluids comprising

a housing having a cavity defining an opening for facing a fluid,

a printed circuit board adjacent the cavity,

a radiation emitting diode mounted on the printed circuit board for projecting radiation from the opening into the fluid;

a plurality of radiation detectors mounted on the printed circuit board adjacent the diode and on at least two different sides of the radiation emitting diode for receiving radiation passing from the fluild into the opening;

means for preventing radiation emitted by the diode from impinging directly on the detectors such that the detectors respond to radiation reflected by particles in the fluid;

a potting matereial which is transparent to the radiation emitted by the diode, filling the cavity and encasing the printed circuit board, the diode and the detectors; and

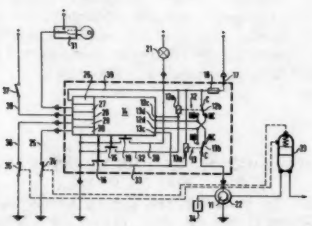
wire means connected to the printed circuit board and extending from the housing for connecting the diode and the detectors to a particle sensor operating and indicating circuit.

4,841,158

SAFETY RELAY CIRCUIT FOR SWITCHING ON ELECTRIC SYSTEMS OF AUTOMOTIVE VEHICLES

Franz Latka, Niddatal, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,328
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3709059
Int. Cl.[4] B60T *17/18*
U.S. Cl. 307—10.1 15 Claims



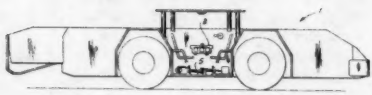
1. A safety relay circuit for the ignition switch controlled electrical system of an automotive vehicle, said safety circuit comprising a pair of change-over relays, each having a contact arm shiftable between a normal open contact and a normal closed contact and being engaged with the normal closed contact when the relay is in its normal deenergized. state, the open contact of each relay being connected to the closed contact of the other, one of said closed contacts being connected to an electrical power source and the other of said closed contacts being connected to said electrical system, control circuit means connected to said ignition switch and to a pair of normally open relay control switches respectively connected to said relays to energize the relay when the relay switch connected thereto is closed, said control circuit including means for maintaining both of said control switches in their respective normal open positions when said ignition switch is off and for closing one of said control switches only upon a first actuation of said ignition switch and for closing the other of said control switches only upon the next subsequent actuation of said ignition switch, and auxiliary switch actuating means connected to said control circuit for energizing or deenergizing said relays independently of said control switches.

4,841,159

SWITCHING AND TESTING SYSTEM

Vernon C. Evans, New Athens, and George H. Heidinger, Sparta, both of Ill., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Aug. 29, 1986, Ser. No. 902,217
Int. Cl.[4] H02J *3/14;* G08B *19/00*
U.S. Cl. 307—38 16 Claims



1. A switching system for powering first and second electrical loads from a voltage supply, the electrical loads being operable from controls and connected to the voltage supply by the switching system, the switching system comprising:

electronic switch means having a control element which is responsive to a control voltage difference to cause said switch means to become conductive, said switch means having a switch terminal connected to a first supply line and another switch terminal connected to the first electrical load;

means responsive to the controls for generating the control voltage difference when the voltage supply is connected to the first supply line thereby powering the first electrical load from the first supply line;

means responsive to the controls for generating first and second control signals;

a first contactor, responsive to the first control signal, for connecting the voltage supply to a first supply line , the first electrical load connected to the first supply line; and

a second contactor, responsive to the second control signal, for connecting the second supply line to the first supply line thereby connecting the voltage supply to the second supply line, and causing said means for generating the control voltage difference to interrupt power through the electronic switch means thereby discontinuing the supply of power to the first electrical load.

4,841,160

POWER SUPPLY SWITCHING CIRCUIT

Steven A. Yon, Altamonte Springs, and Luis A. Diaz, Apopka, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 1, 1988, Ser. No. 278,636
Int. Cl.[4] H02J *7/00*
U.S. Cl. 307—66 38 Claims

1. A power supply comprising:

an input for receiving a power signal;

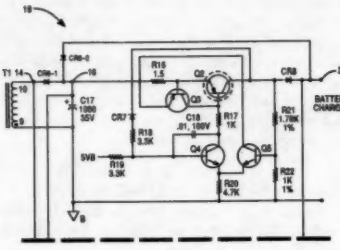
a DC storage device connected to said input;

a voltage regulator connected to said DC storage device and having a primary output connectable to a battery;

a first diode connecting said primary output to said DC storage device;

a DC to DC converter for converting the voltage at said DC storage device to an auxiliary DC voltage, said converter having a supply voltage input; and

a switching circuit including:



a first switch responsive to said power signal for providing said DC storage device voltage to said converter supply voltage input;

a second switch responsive to the voltage on said battery for providing said DC storage device voltage to said converter supply voltage input; and

a third switch responsive to an auxiliary voltage on/off signal for overriding said second switch.

4,841,161

MONITORING CIRCUIT FOR CONTROL MEANS AND SELECTIVE BREAKAWAY MEANS IN MODULAR SUPPLY SYSTEMS

Salvatore Lentini, and Giuseppe Patti, both of Palermo, Italy, assignors to Italtel Societa Italiana Telecomunicazioni s.p.a, Milan, Italy

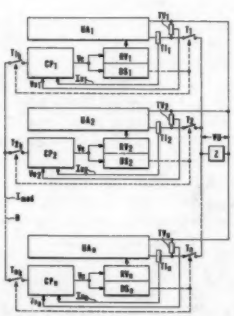
PCT No. PCT/EP86/00415, § 371 Date Feb. 2, 1987, § 102(e) Date Feb. 2, 1987, PCT Pub. No. WO87/00655, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 15, 1986, Ser. No. 10,281

Claims priority, application Italy, Jul. 16, 1985, 21584 A/85

Int. Cl.[4] H02J *1/00*

U.S. Cl. 307—85 **3 Claims**



1. A modular supply system for controlling power supplied to a load, comprising:

a plurality of power units connected in parallel, each of said plurality of power units including,

power supply means for supplying a voltage signal and a current signal to the load,

first monitoring means for developing an error signal corresponding to the difference between said current signal and a source current signal,

second monitoring means for developing a voltage error signal corresponding to the summation of said voltage and said error signal,

control means for regulating said voltage and current signals supplied from said power supply means within a predetermined tolerance limit in response to said voltage error signal, and

selective breakaway means for disconnecting said power supply means in response to said voltage error signal being detected outside of said predetermined tolerance limit;

each of said plurality of power units that has said power supply means connected providing an equal distribution of power to the load.

4,841,162

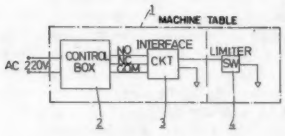
LIMITER SWITCHING APPARATUS

Bor-Cherng Lay, No. 156, Ta-Tun 1st St., and Shoei-Sheng Jou, No. 12, Alley 5, Lane 500, Wu-Chyuan Rd., both of Taichung, Taiwan

Filed Jul. 14, 1988, Ser. No. 219,002

Int. Cl.[4] H03K *19/12*

U.S. Cl. 307—112 **4 Claims**



1. A limiter switching apparatus comprising:

a control box made of non-conductive material and adapted for being installed on a metal surface of a machine table;

a plurality of spacing members evenly formed on a top surface of said control box;

a plurality of electrical terminals respectively provided at each area defined by said spacing members for making internal and external electrical connections therewith;

an interface circuit means designed for being operated with minimal current and voltage to prevent electrical leakage and electrically disposed in said control box with electrical connection points respectively connected to each one of said electrical terminals of the control box for effecting electrical connections and disconnections therewith; and

a limiter switch installed at a proper place on the machine table and electrically connected to said interface circuit means through a single electrical line and a common contact of the machine table for being caused to close and open so as to activate and deactivate said interface circuit means; thereby, switching operations of said interface circuit device can be effectively performed within said control box in any conditions without incurring electrical leakage.

4,841,163

PROXIMITY SWITCH IMMUNE TO INTERFERENCE FIELDS

Jens Mueller, Radevormwald, Fed. Rep. of Germany, assignor to Werner Turck GmbH Co., KG., Halver, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 155,770

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704893

Int. Cl.[4] H01H *35/00;* **G08B** *13/00*

U.S. Cl. 307—116 **3 Claims**

1. A proximity switch immune to interference fields comprising:

an oscillator circuit (1) including a coil (13) having an amorphous metal core, said oscillator circuit being controllable by a permanent magnet and being damped in its basic condition by the core of the coil and being undampable by the approach of a permanent magnet,

a first signal evaluating circuit (2) connected to the oscillator circuit output (17) and providing an output signal corresponding to the undamped condition of the oscillator circuit (1),

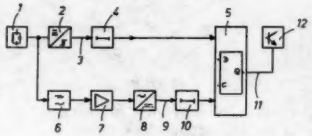
a blockable holding circuit (5) in the form of a D flip-flop with a switching signal input (D) having the output (3) of the first signal evaluating circuit (2) connected thereto, and with a blocking signal input (C),

a filter (6) tuned to the frequency of the interfering alternating magnetic field to be considered,

a second signal evaluating circuit (8) including a multivibrator stage, the second signal evaluating circuit being connected via the filter to the oscillator circuit output (17), for transmitting via the multivibrator stage a blocking signal, continuous over the duration of the interference, to the blocking signal input (C) of the blockable holding circuit (5) only upon the occurrence of an oscillator circuit output signal of the frequency of the interfering alternating magnetic field, the holding circuit being responsive to the blocking signal by retaining the output (11) of the holding circuit at the last-assumed value thereof so that the output of the holding circuit (5) can no longer be influenced by the approach or distancing of the permanent magnet,

a final stage (12) connected to the holding circuit output (11) and including an electronic switch for the circuit to be switched and a firing device for the electronic switch, and

a supply circuit for the oscillator circuit (1) and the two signal evaluating circuits (2 and 8).



4,841,164

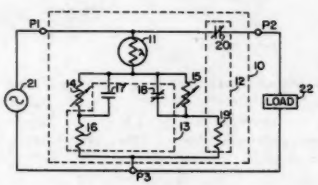
LIGHT-SENSITIVE SWITCH STRUCTURE AND METHOD WITH INVERSE OFF/ON RATIO

Egidio Basso, 9145 Dallas, Grosse Ile, Mich. 48138

Continuation-in-part of Ser. No. 828,370, Feb. 11, 1986, Pat. No. 4,771,186. This application Jul. 18, 1988, Ser. No. 219,743

Int. Cl.[4] H01H *35/00, 47/24*

U.S. Cl. 307—117 **20 Claims**



1. Condition responsive primarily electronic switch means responsive to at least one of light, temperature, pressure and sound conditions for use in conjunction with a source of electrical energy and an electrical load for automatically connecting and disconnecting the electrical load from the source of electric energy, which primarily electronic switch means is responsive to a specific sequence of the condition levels to achieve an inverse off/on ratio whereby the electric load is disconnected from the source of electrical energy at a lower condition level to which said primarily electronic switch means is responsive than the condition level at which the electrical load is connected to the source of electrical energy.

4,841,165

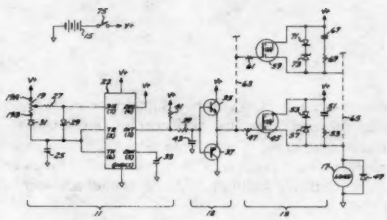
D. C. POWER CONTROLLER

Gary L. Bowles, Long Beach, Calif., assignor to Wesley H. Heinmiller, Wilmington, Calif.

Filed Feb. 12, 1988, Ser. No. 155,594

Int. Cl.[4] H02J *1/02*

U.S. Cl. 307—132 R **11 Claims**



1. Apparatus for controlling the rate at which electric power is furnished to a load from a source of direct current, the apparatus comprising:

a signal generator operative to provide a periodic signal having a first value during a first portion of each period and a second value during a second portion of the period, the signal generator comprising a timing capacitor and circuit means operative to alternately charge the capacitor at a first rate and discharge the capacitor at a second rate, the duration of the first portion of each period being determined by the first and the duration of the second portion of each period being determined by the second rate,

switch means responsive to the signal to enable direct current from the source to flow through the load during the time the signal has one of said values and to prevent the current from flowing during the time the signal has the other value; and

control means manually operable to vary the relative durations of the first and second portions of each period and thereby control the rate at which electric power is furnished to the load.

4,841,166

LIMITING SHOOT-THROUGH CURRENT IN A POWER MOSFET HALF-BRIDGE DURING INTRINSIC DIODE RECOVERY

James A. Harnden, San Jose, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Filed Jul. 17, 1987, Ser. No. 74,903

Int. Cl.[4] H03K *19/094;* **G05F** *1/46*

U.S. Cl. 307—246 **14 Claims**

7. A circuit for switching current to an inductive load comprising:

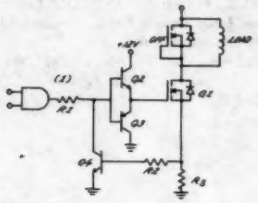
a low-side MOSFET with an intrinsic body-drain diode to clamp inductive flyback energy, said low-side MOSFET having a drain connected to a supply return, a source, and a gate connected to a source of bias potential;

a high-side P-channel MOSFET having a source connected to a supply voltage, a drain connected to said source of said low-side MOSFET and through an inductive load to said supply return, and a gate;

means for sensing the current between said source and drain of said high-side MOSFET;

a control input terminal for receiving a control signal indicating when said high-side MOSFET is to turn on; and

means responsive to said control signal for supplying a bias signal to said gate of said high-side MOSFET in order to cause said high-side MOSFET to turn on, said means



responsive reducing said bias signal when said means for sensing determines that said current flow between said source and drain of said high-side MOSFET exceeds a predetermined magnitude during the recovery time (Trr) of said intrinsic body-drain diode of said low-side MOSFET.

4,841,167

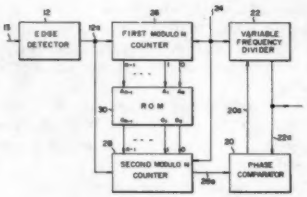
CLOCK RECOVERING DEVICE

Noboru Saegusa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,794

Int. Cl.[4] H03K *5/13, 1/17*

U.S. Cl. 307—269 **7 Claims**



1. A clock recovering device comprising:

an edge detector means for producing a pulse when received data changes;

a first counter means for counting a high-speed clock which is an integral multiple times higher than a transmission rate of the received data, and reset by the pulse output of said edge detector means;

a logic means for processing an output of said first counter means;

a second counter means for receiving an output of said logic means and reset by the pulse output for counting the high-speed clock;

a phase comparator means for deciding a phase of recovered clock by comparing the recovered clock with a carry which is output by said second counter means; and

a variable frequency divider means controlled in frequency division number by an output of said phase comparator means for producing the recovered clock from the high-speed clock.

4,841,168

MASTER SLAVE LATCH CIRCUIT WITH RACE PREVENTION

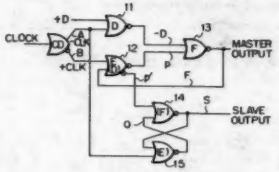
Katuhisa Kubota, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,795

Claims priority, application Japan, Nov. 26, 1985, 60-266462; Mar. 20, 1986, 61-062914

Int. Cl.[4] H03K *3/284, 17/16, 19/02*

U.S. Cl. 307—272.2 **3 Claims**



1. A master slave latch circuit, comprising:

clock means for outputting clock pulses each having first and second edges;

a master latch circuit, having a latch gate, outputting a master output signal in synchronization with the first edge of each clock pulse; and

a slave latch circuit outputting a slave output signal in synchronization with the second edge of each clock pulse, said latch gate of said master latch circuit operating as a data gate for said slave latch circuit.

4,841,169

DUAL-GATE FET AMPLIFIER-MIXER WITH INTERMEDIATE OHMIC ISLAND FOR REJECTING A FREQUENCY BAND

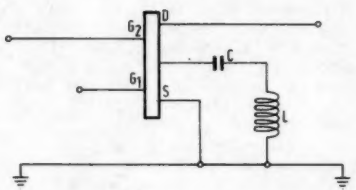
Christos Tsironis, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 469,593, Feb. 24, 1983, abandoned. This application Feb. 24, 1986, Ser. No. 833,571

Claims priority, application France, Mar. 3, 1982, 82 03510

Int. Cl.[4] H03K *3/26, 3/353*

U.S. Cl. 307—303 **2 Claims**



1. An amplifier-filter-mixer device comprising a single dual-gate field effect transistor including a semiconductor substate on which are disposed:

(a) a source electrode spaced apart from a drain electrode;

(b) spaced-apart first and second gate electrodes located between the source and drain electrodes;

(c) an ohmic island located between the first and second gate electrodes; and

(d) a band rejection filter comprising a resonant circuit including an inductor and a capacitor electrically connected in series, said resonant circuit having first and second ends, the first end being electrically connected to the ohmic island;

said device being operable such that when predetermined bias voltages are applied thereto:

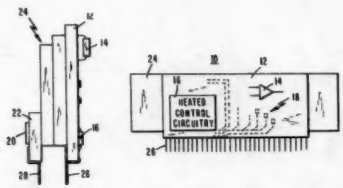
(1) a first part of the field effect transistor electrically coupled to the first gate electrode and extending from the source electrode to the ohmic island effects amplification of an input signal applied to the first gate electrode;
(2) a second part of the field effect transistor electrically coupled to the second gate electrode and extending from the ohmic island to the drain electrode effects mixing of the amplified input signal with a local oscillator signal applied to the second gate electrode; and
(3) said resonant circuit rejects noise signals received at the first gate electrode and parasitic signals produced during mixing of the input signal and the local oscillator signal;
said predetermined bias voltages including a common reference voltage applied to the source electrode and the second end of the resonant circuit, and voltages applied to the drain electrode and the first and second gate electrodes which effect saturated operation of the first part of the field effect transistor and non-saturated operation of the second part of the field effect transistor.

4,841,170

TEMPERATURE CONTROLLED HYBRID ASSEMBLY

Larry E. Eccleston, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Dec. 8, 1986, Ser. No. 939,522
Int. Cl.[4] H01L *27/00*
U.S. Cl. 307—310 **22 Claims**



1. A hybrid electronic circuit arrangement comprising:
a substrate;
an electrical circuit formed on said substrate;
a temperature control means formed on said substrate; and
heat generating circuit means formed on said substrate for heating said electrical circuit to operate at predetermined temperature conditions,
said heat generating circuit means connected to and responsive to said temperature control means,
said heat generating circuit means in close thermal conductivity with said electrical circuit for eliminating requirement of heat enclosure therefor,
at least one element of said electrical circuit, said temperature control means, and said heat generating circuit means comprising an integrated circuit and at least another element of said electrical circuit, said temperature control means, and said heat generating circuit means comprising a film resistor.

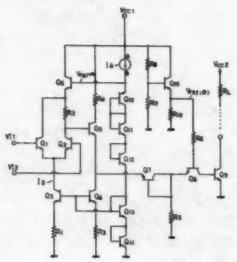
4,841,171

HIGH SPEED COMPARATOR CIRCUIT WITH SINGLE SUPPLY VOLTAGE

Song Dong-Il, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1987, Ser. No. 139,734
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—355 **21 Claims**

1. A high speed comparator circuit, comprising:
first and second resistances, said first resistance being connectable to a reference potential;
first and second semiconductor devices each having emitter electrodes connectable in common to a reference potential via said first resistance, each having a base electrode providing a discrete respective first and second input terminal, said second resistance being coupled to form a first node between a collector electrode of said first semiconductor device and a second node with a collector terminal of said second semiconductor device;
third and fourth transistors each having a common collector-base junction coupled in common with an emitter electrode of said third transistor coupled to a third node;
a fifth transistor having a base electrode coupled to said second node, a collector electrode connectable to a common voltage source, and an emitter electrode connectable to said reference potential;
a sixth transistor having a collector electrode connectable to a common voltage source, an emitter electrode coupled to said first node, a base electrode coupled to said third node, and exhibiting a forward voltage V_{BE} between the base and the emitter electrode of the sixth transistor matched with forward voltage V_{BE} of the fourth transistor;
a seventh transistor having a collector-base junction connectable to said reference potential, and an emitter electrode coupled to said emitter electrode of said fifth transistor;



an eighth transistor having a common collector-base junction connected to an emitter electrode of said fourth transistor, the forward voltage V_{BE} of the eighth transistor; and
a ninth transistor having a common collector-base junction connected to an emitter of said eighth transistor and between said commonly connected emitter electrodes of said first and second transistors and said first resistance and said emitter electrode of said fifth transistor;
the backward voltage V_{EC} between the emitter and the collector of the seventh transistor being matched with the backward voltage V_{EC} of the third transistor;
wherein, when both inputs of the first and second input terminals are equal to each other, if the value of said first resistance is equal to one-half of the value of said second resistance, then voltage drop across the second resistance is equal to V_{BE} and this voltage is matched with voltage between the base and the emitter of the ninth transistor,
whereby well balanced square waves are produced by operation of said first and second transistors by a single current source.

4,841,172

BIPOLAR-MOS LOGIC CIRCUIT WITH HIGH SPEED OPERATION

Masaji Ueno, and Hideaki Masuoka, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 28, 1988, Ser. No. 225,495
Claims priority, application Japan, Aug. 5, 1987, 62-194527
Int. Cl.[4] H03K *17/04, 19/013, 17/62*
U.S. Cl. 307—443 **7 Claims**

1. A logic circuit for supplying an output signal having a prescribed waveform and one of two levels in response to a

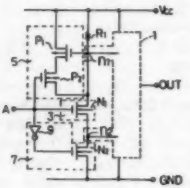
prescribed input signal and a power source voltage, comprising:

output circuit means for generating the output signal, including first and second output transistor means for alternately providing a first level output signal and a second level output signal;

resistive means responsive to the power source voltage for supplying a current to the first output transistor means;

current control means connected in parallel with the resistive means for controlling the current supplied to the first output transistor means, including first and second MOS transistor means for controlling the waveform of the first level output signal in accordance with the ratio of the channel length to the width of the first and second MOS transistor means; and

output control means for controlling the first and second output transistor means in response to the input signal for supplying one of the first level output signal and the second level output signal.



4,841,173

BIPOLAR LOGIC CIRCUIT

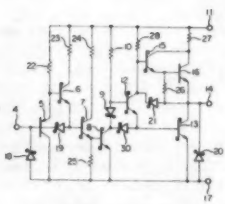
Tsunehiro Koyama, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 4, 1987, Ser. No. 81,227

Claims priority, application Japan, Aug. 7, 1986, 61-186649

Int. Cl.[4] H03K *19/088, 5/08, 17/687*

U.S. Cl. 307—456 **2 Claims**



1. A bipolar logic circuit comprising:

an output Darlington transistor and a first transistor which are connected in series between a high potential source and a low potential source, the first transistor conducting transient current,

a second transistor whose collector is connected to a base of the output Darlington transistor and is connected to the high potential source through a resistor, whose emitter is connected to a base of the first transistor, and whose base is connected to the high potential source through a resistor,

a third transistor whose emitter is connected to the low potential source and whose base is supplied with a signal corresponding to an input signal,

a first diode whose anode is connected to the base of the second transistor and whose cathode is connected to a collector of the third transistor; and

a second diode whose anode is connected to said emitter of said second transistor and whose cathode is connected to said collector of said third transistor to lessen the transient current of the first transistor and turn off the first and second transistors simultaneously.

4,841,174

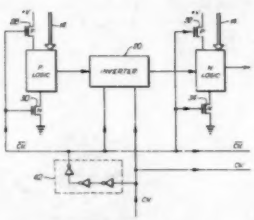
CMOS CIRCUIT WITH RACEFREE SINGLE CLOCK DYNAMIC LOGIC

Randall M. Chung, Laguna Niguel, and Bradley S. Masters, Chino, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 789,383, Oct. 21, 1985, Pat. No. 4,740,721. This application Feb. 12, 1987, Ser. No. 13,694

Int. Cl.[4] H03K *19/094;* **G06F** *7/38*

U.S. Cl. 307—469 **10 Claims**



1. A CMOS circuit employing dynamic logic, comprising:

clock means for supplying a clock signal;

complement clock means for supplying a complement clock signal having delayed transitions with respect to said clock signal;

first logic means, coupled to said complement clock means and comprising one or more logic gates of transistors of a first conductivity type, for receiving one or more externally provided input logic signals and performing first predetermined logic operations thereon and for providing first logic output signals corresponding to said logic operations performed on said input logic signals, wherein the timing of said first logic operations are controlled by said complement clock signal;

latch means, comprising transistors of said first conductivity type and a second conductivity type, for receiving said first logic output signals from said first logic means and latching said first logic output signals during a predetermined phase of said clock signal and the corresponding complement phase of said complement clock signal;

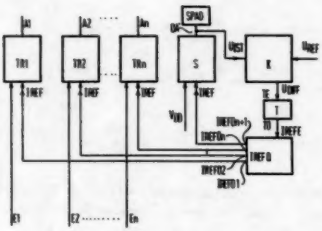
second logic means, coupled to said clock means and comprising one or more logic gates of transistors of said second conductivity type, for receiving one or more of said latched first logic output signals and performing second predetermined logic operations thereon and for providing the result of said second logic operations as second logic output signals, wherein said second predetermined logic operations are synchronized by said complement clock signal; and

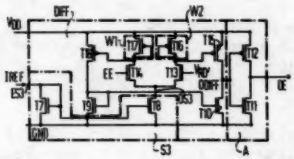
each of said first logic means and said second logic means further comprising at least one precharge transistor and one evaluate transistor, said precharge transistors having switching characteristics slightly slower than the transistors employed in said logic gates and said latch means.

4,841,175
ECL-COMPATIBLE INPUT/OUTPUT CIRCUITS IN CMOS TECHNOLOGY

Erik De Man, and Stefan Meier, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,886
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701986
Int. Cl.[4] H03K *19/092, 19/086;* H03F *3/45*
U.S. Cl. 307—475 15 Claims





1. An ECL-compatible input/output circuit in CMOS technology, comprising a plurality of driver stages, a sensor stage, a comparator, a low-pass filter and a reference current source; the sensor stage, the comparator, the low-pass filter and the reference current source forming a control circuit; the comparator having two inputs and an output; the output of the comparator connected to the reference current source via the low-pass filter; the reference current source having n+1, where n is a whole number, outputs and having a respective output connected to a corresponding driver stage and to the sensor stage; an output of the sensor stage being connected to a first input of the two inputs of the comparator; a second input of the two inputs of the comparator being connected to an external reference voltage; the driver stages and the sensor stage each containing an external terminal; the sensor stage containing an input connected to a positive voltage; and the driver stages containing inputs for input signals of the ECL-compatible input/output circuit.

4,841,176
OUTPUT DISABLE CONTROL CIRCUIT FOR ECL PROGRAMMABLE ARRAY LOGIC DEVICE

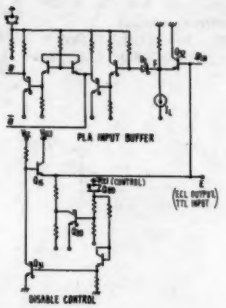
Michael S. Millhollan, Saratoga, and Chiakang Sung, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 868,641, May 29, 1986. This application Apr. 3, 1987, Ser. No. 34,400
Int. Cl.[4] H03K *19/092, 17/16, 19/088*
U.S. Cl. 307—475 5 Claims

1. Disable circuitry for disabling an output node of an ECL programmable array logic circuit so that the output node can serve as an input for TTL signals, the disable circuitry comprising:

means for generating a control signal; and

disable control means operatively connected to the output node and responsive to the control signal for disabling the output node such that TTL signals can be applied to the

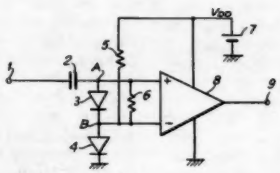


output node as inputs to the ECL programmable array logic circuit in a first mode.

4,841,177
COMPARATOR CIRCUIT OPERABLE FOR A WIDE RANGE OF INPUT SIGNAL

Takahiro Sugiyama, and Mitsutoshi Sugawara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,873
Claims priority, application Japan, Jan. 7, 1987, 62-2213
Int. Cl.[4] G06G *7/12;* H03K *5/00, 5/22, 5/153*
U.S. Cl. 307—494 9 Claims

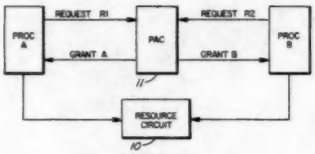


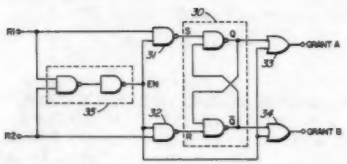
1. A comparator circuit comprising a signal input terminal receiving an input signal, a signal output terminal, first and second voltage terminals, a differential amplifier having first and second input nodes and an output node, said output node having no ohmic electrical connection with said first and second input nodes, a capacitor coupled between said signal input terminal and said first input node, a first diode coupled between said second input node and said second voltage terminal in a forward direction thereof from said second input node to said second voltage terminal, first means coupled only between said second input node and said first voltage terminal without connection to said output node for biasing said first diode to make said first diode conductive in a forward-biased state, a second diode coupled between said first and second input nodes to clamp a voltage difference between said first and second input nodes to a predetermined value, second means coupled to at least said first input node for gradually equalizing the potential at first input node to the potential at said second input node with a predetermined time constant irrespective of a level of said output node, said time constant being greater than an interval period between two succeeding occurrences of said input signal, and a lead means for coupling said output node to said signal output terminal, whereby a voltage difference is provided between said first input node and said second input node during said interval period.

4,841,178
ASYNCHRONOUS PROCESSOR ARBITRATION CIRCUIT

Joël Bisson, Vancouver, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Feb. 23, 1988, Ser. No. 159,332
Int. Cl.[4] G01R 19/145; G06F 1/00
U.S. Cl. 307—518 6 Claims





3. An asynchronous processor arbitration circuit comprising, a pair of input terminals each one for connection to a respective source of request signals, a latch circuit having set and reset terminals and corresponding output terminals, a pair of gates each having their respective output terminals connected to the set and reset input terminals and each having a first input terminal connected to a respective one of the pair of input terminals and each gate also having a second input terminal connected to an enable terminal, and a delay circuit responsive to a request signal on either of said input terminals for generating an enabling signal on said enable terminal, the enabling signal being effective for disabling said pair of gates after a predetermined period of time subsequent to the occurrence of said request signal, the predetermined period of time being larger than the time required to stabilize the latch circuit and

a pair of OR gating means connected between the output terminals of the latch circuit and circuit output terminals, the pair of OR gating means being responsive to the enabling signal for allowing the output from the latch circuit to be available on the circuit output terminal only after said predetermined period of time.

4,841,179
PHASE EQUALIZING ACTIVE FILTER

Hideyuki Hagino, Fukaya, and Takahiro Kusano, Kumagaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 136,968
Claims priority, application Japan, Dec. 26, 1986, 61-315355
Int. Cl.[4] H03B 1/00; H03K 5/00
U.S. Cl. 307—520 8 Claims

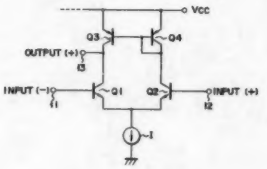
1. An active filter comprising:

a signal input terminal coupled for reception with an input signal;

a first operational amplifier with positive and negative input terminals and a positive output terminal, said positive input terminal being connected to said signal input terminal, and said positive output terminal being grounded through a first capacitor;

a second operational amplifier with positive and negative input terminals and a positive output terminal, said positive input terminal being connected to the positive output terminal of said first operational amplifier, and said positive output terminal being connected to the positive input terminal of said first operational amplifier, through a second capacitor;

a buffer with input and output terminals, said input terminal being connected to the positive output terminal of said second operational amplifier, and said output terminal being connected to the negative input terminal of said first operational amplifier;



a first resistor connected at the first end to the positive input terminal of said first operational amplifier and connected at the second end to the negative input terminal of said second operational amplifier;

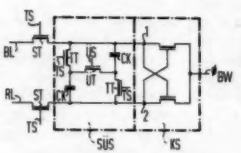
a second resistor connected at the first end to the second end of said first resistor, and at the second end to the output terminal of said buffer; and

a signal output terminal connected to the output terminal of said buffer.

4,841,180
INTEGRABLE EVALUATING CIRCUIT

Rainer Kraus, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 17, 1987, Ser. No. 74,764
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625020
Int. Cl.[4] G01R 19/00; H03K 17/687, 17/16, 19/017
U.S. Cl. 307—530 11 Claims



1. Integrable evaluating circuit, comprising:

a trigger circuit,

a first and second circuit node, both of which serve both as inputs and as mutually-complementary outputs for said trigger circuit,

a pair of signal lines exhibiting the same potential in a rest state,

switching transistors each being connected between a respective one of said two circuit nodes and a respective signal line of said pair of signal lines,

wherein each switching transistor has a first current-carrying connection connected with a respective one of said circuit nodes, has a second current-carrying connection connected with a respective one of said signal lines, and has a control connection connected with an isolation signal having a signal elevation of a given amount,

a signal-enhancement circuit connected between said trigger circuit and said pair of signal lines,

said switching transistors initially connecting a signal occurring on a given one of said two signal lines with its signal elevation to said circuit node connected to said given signal line,

wherein said switching transistor connected to said given one of said two signal lines operates to switch the signal from said circuit node connected to said given signal line,

wherein said signal-enhancement circuit operates to increase the potential of said circuit node connected to said given signal line by a given amount while simultaneously reducing the potential at the other one of said two circuit nodes as a result of a potential shift, and

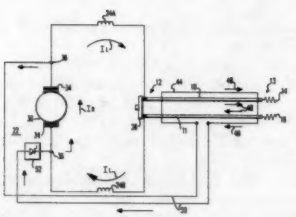
wherein said signal-enhancement circuit operates to reduce the potential of said circuit node connected to said given signal line and to increase the potential of the other one of said two circuit nodes if the signal has a negative signal elevation.

4,841,181

ELECTROMAGNETIC LAUNCHER WITH POST-FIRING ENERGY RECOVERY FOR SLOW OR RAPID FIRE OPERATION

George A. Kemeny, Wilkins Township, Allegheny County, and Daniel W. Deis, Churchill Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1987, Ser. No. 121,011
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 **13 Claims**



1. Electromagnetic projectile launcher apparatus comprising:

(a) a source of high current including energy storing inductance and a generator in series with said inductance and including a rotor and rotor terminals;

(b) a rail system including first and second generally parallel, conducting rails having a breech end and a muzzle end;

(c) an armature for conducting current between said rails and for accelerating a projectile along said rails;

(d) switch means connected to said breech end to initiate injection of said high current into said rails and armature whereby said projectile is launched out said muzzle end;

(e) means for recovering inductive energy remaining in said rail system after a launch; and

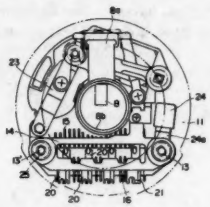
(f) means for transferring said recovered energy back to said generator to increase the kinetic energy of said rotor to a level above that which it would have without said recovery of energy.

4,841,182

RECTIFIER IN ALTERNATING GENERATORS FOR AUTOMOTIVE VEHICLES

Kyoshi Tsuchiya, Kiryu; Hideyuki Ioka, Maebashi, and Hideyuki Takahashi, Ashikaga, all of Japan, assignors to Mitsuba Electric Mfg., Co., Ltd., Japan

Filed Aug. 27, 1987, Ser. No. 89,967
Claims priority, application Japan, Aug. 28, 1986, 61-131811[U]; Sep. 1, 1986, 61-132717[U]; Sep. 1, 1986, 61-132718[U]; Jun. 6, 1987, 62-141712
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 D **16 Claims**



1. An alternating current generator for automotive vehicles comprising:

a pair of opposed case brackets,

a core shaft rotatably supported between the case brackets,

a rotor core fitted to the core shaft,

a rotor coil wound over the rotor core to form a rotor disposed between the case brackets, the rotor being rotatable about the axis of the core shaft,

stator means, surrounding the rotor, for having an alternating current induced therein by the rotational movement of the rotor,

rectifier means for rectifying alternating current induced in the stator, the rectifier means being secured to one of the case brackets so as to be disposed between the rotor and said one of the case brackets, and

a cooling fan provided on the rotor core, the cooling fan generating, in the generator, an air flow in a direction substantially along the axis of the core shaft so as to cool the rectifier means when the rotor is rotated,

said rectifier means comprising a pair of substantially elongated opposed conductive radiators for positive and negative sides respectively, each having embedded therein diode chips arranged in a juxtaposed fashion, said radiators extending in a direction substantially perpendicular to the axis of the core shaft, and being radially spaced from each other to form an air pathway therebetween into which the air flow is introduced, whereby substantial surface area for heat transfer is ensured on mutually opposing surfaces of the radiators.

4,841,183

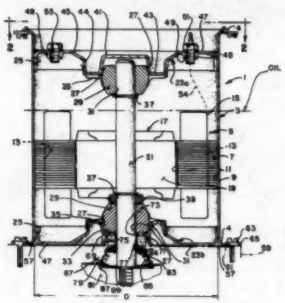
DYNAMOELECTRIC MACHINE CONSTRUCTION AND METHOD

L. Ranney Dohogne, and Raymond D. Heilman, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 27, 1986, Ser. No. 923,480
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 **2 Claims**

1. A dynamoelectric machine comprising a cylindrical housing, a stator core having an outer periphery, said stator core having a central bore therethrough and a plurality of slots extending radially outwardly from said central bore, windings inserted in said slots, said stator core being sized relative to said housing so as to be positively secured within said housing when said stator core is foreceably inserted into said housing, a rotor rotatably received within said stator core bore, a rotor shaft extending outwardly from said dynamoelectric machine,

a bearing support at each end of said housing, a bearing carried by each of said bearing supports for receiving and journaling said rotor shaft, wherein one of said bearing supports has a central opening through which said rotor shaft extends for connection to an application member, the inner portion of said central opening constituting a bearing race, said rotor shaft being journaled by a bearing received in said bearing race, said bearing having an outer end face perpendicular to said rotor shaft, the outer portion of said central opening being generally cylindrical and constituting a seal bore, said application member being carried by and being rotatable with said rotor shaft, a seal between said seal bore and said application member for slidably sealing said shaft and application member with respect to said bearing, said seal having a first seal portion sealed with respect to said seal bore, a central seal opening for receiving



said rotor shaft, an outer cylindrical wall for sealing said seal with respect to said seal bore of said bearing support and an inner face substantially perpendicular to said central opening of said bearing support for being in face-to-face abutting relation with said outer end of said bearing thereby to at least in part align said seal with respect to said bearing and to said shaft, and a second seal portion sealed with respect to said application member, said first seal portion being stationary with said seal bore, said second seal portion being rotary with said application member and rotor shaft, a stationary sealing surface carried by said first seal portion, and a rotary seal member having a rotary sealing surface, said rotary seal member being carried by a said second seal portion with said rotary sealing surface being in face-to-face sliding, sealing engagement with said stationary sealing surface of said first seal portion.

4,841,184

VELOCITY AND IMBALANCE OBSERVER CONTROL CIRCUIT FOR ACTIVE MAGNETIC BEARING OR DAMPER

Hsiang M. Chen, Latham; Martin W. Eusepi, Rexford, and Robert E. Johnson, Ballson Spa, all of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 23, 1987, Ser. No. 65,574

Int. Cl.[4] F16C *39/06*

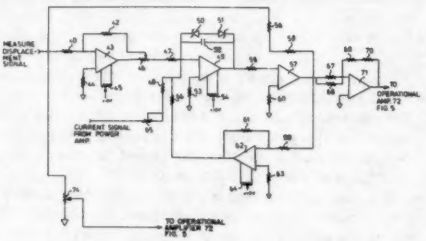
U.S. Cl. 310—90.5 **4 Claims**

1. A system for stabilizing a journal in the magnetic field of an attractive type active magnetic bearing including coil means comprising:

means for sensing a displacement of said journal;

means for measuring control current;

a velocity observer circuit connected to said sensing means comprising integrators and functioning to feedback control signals based on said journal displacement and said control current; and driver circuitry connected to said



velocity observer circuit and functioning to apply said feedback control signals to said coil means.

4,841,185

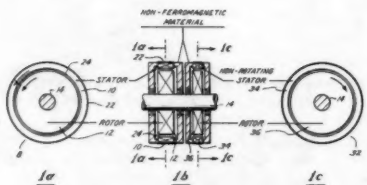
RISING FREQUENCY GENERATOR

William F. Weldon, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 9, 1987, Ser. No. 36,541

Int. Cl.[4] H02K *23/60*

U.S. Cl. 310—115 **1 Claim**



1. An alternating current generator whose power output increases in voltage and frequency as power is delivered to an external load, the generator comprising:

a shaft;

a stator having windings, the stator positioned for rotating about the shaft;

a rotor having windings, the rotor being rigidly connected to the shaft and positioned for rotating with the shaft, the moment of inertia of the rotor being at least eight times less than the moment of inertia of the stator;

an output port conductively coupled to the windings of the stator; and

means for breaking the shaft including alternator means for providing excitation current for the generator, said alternator means having a rotor rigidly secured to the shaft.

4,841,186

ELECTRONICALLY COMMUTATED, COLLECTORLESS DIRECTED-CURRENT MOTOR

Josef Feigel, Landshut, and Klaus Pfendler, Bonndorf, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,498

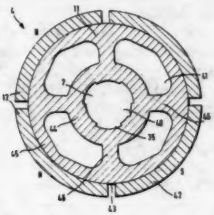
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710658

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 **3 Claims**

2. Electronically commutated, collectorless direct-current motor comprising a rotor having a multipolar body of permanent-magnet material, a shaft, an internal magnetic yoke, and a multipolar stator coil surrounding the rotor and being surrounded by a magnetic yoke, the internal magnetic yoke having axial apertures and being disposed between the shaft and the body of permanent-magnet material, said internal magnetic

yoke having an inner and an outer ring, said body of permanent-magnet material having diametrically arranged magnetic pieces, said two rings being interconnected by several bridge



portions whose number is equal to the number of magnetic pieces, the outer ring varying in thickness at different points, the thickness being the smallest at the center between two bridge portions and the largest at said bridge portions.

4,841,187

ELECTRIC MOTOR WITH ATTACHED TACHOGENERATOR

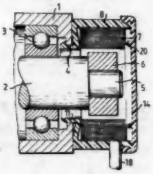
Dieter Hauke, Hatten, and Edgar Zelle, Rastede, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,183

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717180

Int. Cl.[4] H02K *5/10, 5/124;* **G01P** *1/04;* **H02H** *7/093*

U.S. Cl. 310—171 **16 Claims**



1. In an electric motor with an attached tachogenerator wherein said electric motor has a rotatably mounted motor shaft having an end portion which extends outside of a shaft bearing plate of the motor housing through a bore in the bearing plate, and wherein said tachogenerator includes an annular permanent magnet which rotates with said motor shaft and a stationary detector means, including an annular coil positioned adjacent and surrounding said magnet, for providing an output corresponding to the rpm of the motor shaft; the improvement wherein said magnet is mounted on said end portion of said motor shaft, and further comprising: a closeable housing including a hollow cylindrical member surrounding said magnet and said annular coil and having an annular bottom at its end facing said motor housing, with said annular bottom having a center passage opening for said motor shaft, and means for fastening said cylindrical member to said motor housing disposed at said end of said cylindrical member facing said motor housing; and a cap closing the other end of said cylindrical member.

4,841,188

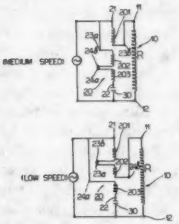
SPEED CHANGING DEVICE FOR ELECTRIC FANS

Chung-Hsing Hao, No. 22-2, Sec. 2, Chang An Rd., Hsi Tun District, Taichung City, Taiwan

Filed Nov. 25, 1987, Ser. No. 125,491

Int. Cl.[4] H02K *17/08*

U.S. Cl. 310—200 **1 Claim**



1. A speed changing device for electric ceiling fans, comprising:

a run coil means for being electrically connected to a stator of a ceiling fan;

a starting and speed changing coil means comprising a set of medium-speed taps and a set of low-speed taps arranged so that three speed-changing coils are formed for being variably coupled with said run coil means and parallel-connected to a power source of the ceiling fan for being switched into a plurality of speed-changing coils without incurring direction change of electrical current flowing therein;

wherein a pre-determined number of said speed-changing coils is arranged to be in series-connection with said run coil means while the rest of said speed-changing coils having a capacitor means connected in series at one end thereof, are made to be in parallel-connection with said run coil means after said capacitor means is actuated when the motor revolution is changed into a low speed.

4,841,189

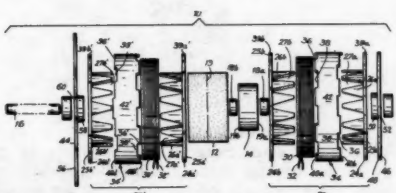
STEPPER MOTOR AND METHOD OF MAKING THE SAME

Roy Cooper, Waterbury, and Charles Hansen, Wolcott, both of Conn., assignors to Tri-tech, Inc., Waterbury, Conn.

Filed Dec. 30, 1987, Ser. No. 121,170

Int. Cl.[4] H02K *37/00*

U.S. Cl. 310—257 **9 Claims**



1. An electric rotating machine comprising, in combination:

an annular permanent magnet rotor having rotor poles of alternating polarity around its circumference, said rotor having an external diameter that is at least 55 percent of the diameter of the machine;

at least two stator phase assemblies each including a pair of pole pieces of annular configuration in opposed relationship with each other to form an annular space therebe-

tween, said pair of pole pieces being disposed concentrically around the outer periphery of said rotor, each said pole piece including along its inner periphery spaced-apart salient stator poles in magnetic flux relationship with the rotor poles, with the stator poles of the pole pieces of each stator phase assembly being interleaved with one another, each said stator phase assembly including annular energizing means surrounding the outer periphery of the rotor and disposed substantially entirely within the annular space between the pair of stator pole pieces for producing a magnetic field in the salient stator poles of said pair;

a multi-part housing for said machine comprising a field ring corresponding to each stator phase assembly, each field ring having first and second side edges each including a plurality of grooves and protrusions and additional parts of said housing having grooves mating with said protrusions, the protrusions on one side edge of the field ring being insertably received by the grooves in one of the additional housing parts and the protrusions on the other side edge of the field ring being insertably received by the grooves in another of the additional housing parts, said grooves and protrusions of each field ring are matingly engageable with the grooves and protrusions of adjacent field rings such that each of the stator poles are at an angular displacement of about a 90 electrical degree index spacing from the stator poles of the adjacent stator phase assembly; and

means for applying current to the energizing means in each of said stator phase assemblies to produce the corresponding magnetic field with the fields of the stator phase assemblies in different phase relationship with each other.

4,841,190

RESIN-FILLED PERMANENT-MAGNET STEPPING MOTOR

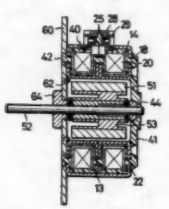
Kunitake Matsushita; Hiroshi Sakuma; Takayuki Yamawaki; Takashi Yoshikura; Hiroshi Sano; Yuzuru Suzuki; Michihiro Torii, and Tohru Ohnuki, all of Iwata, Japan, assignors to Minebea Co., Ltd., Nagano, Japan

Filed Apr. 27, 1988, Ser. No. 186,820

Claims priority, application Japan, May 1, 1987, 62-108143; Jun. 19, 1987, 62-94431[U]

Int. Cl.[4] H02K *37/16*

U.S. Cl. 310—257 **6 Claims**



1. A stepping motor comprising:

two stator units, which comprise a pair of stator yokes, each of said stator yokes having a number of magnetic pole teeth which protrude parallel to an axial direction, and form an annular space between one of said stator yokes and the magnetic pole teeth engaged with each other, and an annular coil comprising a bobbin with magnet wire wrapped therearound disposed in said annular space, said bobbin comprising an annular core having flanges on opposite sides thereof, said two stator units being disposed in a back-to-back relation;

a rotor consisting of a cylindrical magnet and a rotor shaft inserted in said cylindrical magnet, both ends thereof being extended from both ends of the magnet;

a plurality of pins mounted radially in said flanges and connected to at least one magnet wire;

a resin structure filled in the annular spaces and connecting integrally the stator yoke, the annular coil and the pins;

an end plate formed on a first side of the stator and molded integrally with the stator;

a plurality of resinous protrusions formed integrally with the resin structure on a second side of the stator yoke;

a flange plate provided with retaining holes, said protrusions passing through said retaining holes and being deformed to hold said flange plate on said second side of the stator yoke; and

two bearings mounted co-axially, one on the end plate and the other on the flange plate, said bearings rotatably supporting the rotor shaft.

4,841,191

PIEZOELECTRIC ACTUATOR CONTROL APPARATUS

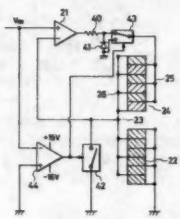
Keiji Takada, Tokorozawa; Masahide Okumura, Sagamihara; Satoru Fukuhara, Kokubunji; Toshiyuki Morimura, Hachioji; Sumio Hosaka, Nishitama, and Shigeyuki Hosoki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,006

Claims priority, application Japan, Feb. 20, 1987, 62-35509; Feb. 20, 1987, 62-35510

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—317 **9 Claims**



1. A piezoelectric actuator control apparatus comprising:

a stack type piezoelectric actuator which has a material that develops strain upon application of an electric field and which further has electrodes for applying an electric field to said material;

a capacitor connected in series with said piezoelectric actuator, said capacitor being comprised of a stack type ceramic capacitor having a structure substantially the same as that of said piezoelectric actuator to thereby cause the leakage currents flowing in the capacitor and in said piezoelectric actuator to be substantially equal to each other;and

control means which controls a voltage applied to said piezoelectric actuator so that a voltage of said capacitor will reach a predetermined value.

4,841,192

PIEZOELECTRIC HYDROPHONE

Per J. Tetlie, Horten; Hans N. Brudal, Tonsberg, and Alf E. Meisingset, Horten, all of Norway, assignors to Getech A/S, Horten, Norway

Filed Sep. 25, 1987, Ser. No. 100,833

Claims priority, application Norway, Sep. 26, 1986, 863841

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—337 **6 Claims**

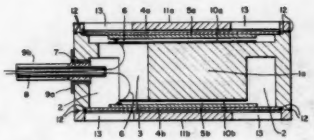
1. A piezoelectric hydrophone comprising:

a hydrophone assembly having side, front and rear edges and an integral center section recessed inwardly from said front and rear edges, the center section being provided with a first aperture therethrough, the hydrophone assembly being provided with a radially extending second aper-

ture in said side edge communicating with said first aperture;

pressure sensitive front and rear diaphragms respectively closing the front and rear edges of the hydrophone assembly, the front and read diaphragms being integrally joined by laser welding to said hydrophone assembly at said front and rear edges thereof respectively, said front and rear diaphragms each having a piezoelectric element attached thereto;

a lead-in tube sealingly fused in said second aperture in said hydrophone assembly by a glass body, said lead-in tube carrying therethrough lead wires connected to the piezoelectric elements, the lead wires extending from the lead-in tube through said first aperture in said center section, the lead-in tube being sealed closed for sealing the interior of the hydrophone;



external overload protection means mounted respectively over each of said front and rear diaphragms at a distance therefrom for protecting said front and rear diaphragms and said piezoelectric elements from destructive deformation due to an internal overpressure condition, said external overload protector means allowing substantially unattenuated propagation of acoustic pressure waves therethrough; and

a gas under pressure sealingly contained in said hydrophone for internally pressurizing the front and rear diaphragms;

and wherein the center section of said hydrophone assembly is integrally formed as one piece with the hydrophone assembly and serves as an internal overload protector means for protecting said front and rear diaphragms and said piezoelectric elements against destructive deformation due to an external overpressure condition.

4,841,193

FLUORESCENT LAMP DEVICE WITH INCANDESCENT BULB TYPE BASE CAP

Naoyuki Nakamura, Bizen, and Masashi Sangen, Kobe, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Feb. 8, 1988, Ser. No. 153,363
Claims priority, application Japan, Feb. 10, 1987, 62-29087
Int. Cl.[4] H01J *61/30*
U.S. Cl. 313—318 **5 Claims**

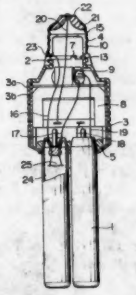
1. A fluorescent lamp device comprising:

a luminous tube unit including four glass tubes, each having a longitudinal axis, arranged so that the intersections of said axes with a plane perpendicular thereto form a rectangle in said plane, each of said tubes having a fluorescent coating on an inner surface thereof and being charged with mercury and rare gases, each of two of said four glass tubes being further provided at one end with an electrode projecting from the inside of said tube to the exterior thereof;

a case having one end secured to said luminous tube unit for the support thereof, the other end of said case being provided with an outwardly projecting portion having an engagement groove in its outer peripheral surface, the outwardly projecting portion of said case further including a stopper portion extending in the direction of said longitudinal axes away from said luminous tube unit;

a ballast located within said case; and

a base cap including a main body having an outer peripheral surface at one end provided with a spiral groove and a base outer cover fitted on to said groove, said main body further having an inner peripheral surface at the other end thereof provided with an engagement portion, a guide groove and a rotation limiting groove in that order starting from said other end of said main body, said base cap being rotatably secured to said case with the engagement portion of said main body fitting within the engagement



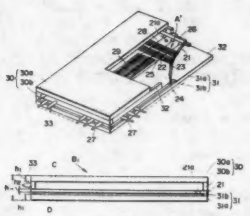
groove of said case, the outwardly projecting portion of said case fitting within the guide groove of said main body and the stopper portion of said case fitting within the rotation limiting groove of said main body, whereby said luminous tube unit is rotatable with respect to said base cap, excessive rotation thereof being prevented by engagement of the stopper portion of said case with an end of the rotation limiting groove of said base cap.

4,841,194

FLUORESCENT DISPLAY DEVICE

Takao Kishino, and Tadashi Mizohata, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Continuation of Ser. No. 827,265, Feb. 7, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,194
Claims priority, application Japan, Feb. 19, 1985, 60-30898
Int. Cl.[4] H01J *63/06*
U.S. Cl. 313—496 **9 Claims**



1. A fluorescent display device comprising:

a casing containing an evacuated chamber;

a substrate disposed in said evacuated chamber, said substrate being formed of a thin layer of sheet glass;

at least one display section formed on said substrate, said display section having a plurality of segments each comprising anode conductors having a phosphor layer deposited on the surface thereof; and

a cathode stretched above said substrate for emitting electrons to be impinged upon said phosphor layer;

wherein said casing comprises a front member for permitting external view of said segments and a rear member for forming a rear surface of said casing, said front member and said rear member being formed of a thin layer of

limited-heat-treated reinforced glass having a strength of about 3.5 times that of sheet glass after formation of said casing, heat treatment of said glass being limited to that required at least for coating of an external electric field shielding film on said front member and assembling said front and rear members together to form said casing;

and wherein said substrate is disposed in said evacuated chamber maintaining spaces between said front member and said substrate and between said substrate and said rear member said spaces allowing deformation of the front member and rear member without touching said substrate so that said substrate is not subject to external forces, said substrate being thinner than said front member.

4,841,195

DISCHARGE LAMP HAVING A YTTRIUM ALUMINUM GARNET DISCHARGE ENVELOPE

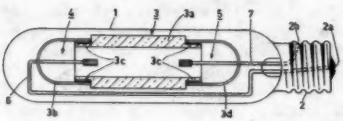
Gijsbertus De With, and Hendricus J. A. Van Dijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 11, 1984, Ser. No. 598,959

Claims priority, application Netherlands, Apr. 29, 1983, 8301514

Int. Cl.[4] H01J *17/16, 61/30*

U.S. Cl. 313—636 **17 Claims**



1. In a high-pressure discharge lamp having a discharge envelope which accommodates an ionizable filling and two main electrodes between which a discharge path extends, said discharge envelope having a wall of ceramic translucent material consisting essentially of densely sintered polycrystalline yttrium aluminium garnet and at lealst one of the substances MgO and SiO_2 in a total quantity of at least 50 ppm by weight, the absolute value of the difference between the SiO_2 and MgO contents being at least 50 ppm by weight, and an excess of MgO being at most 1000 ppm by weight.

4,841,196

TWO-FILAMENT LAMP AND OPERATING CIRCUIT AND METHOD FOR DESIGNING SAME

John F. Waymouth, Marblehead, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 9, 1987, Ser. No. 130,835

Int. Cl.[4] H05B *39/10*

U.S. Cl. 315—65 **17 Claims**

1. An incandescent lamp and operating circuit comprising:

(a) an incandescent lamp including:

(i) a light-transmissive envelope hermetically enclosing an interior;

(ii) first and second electrically conductive lead-in wires running through said envelope and protruding into said interior;

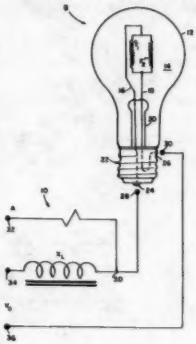
(iii) first and second lamp filaments mounted within said interior, said filaments being electrically coupled with said lead-in wires such that said first filament is electrically in parallel with said second filament between said lead-in wires, said first filament being designed to operate at a first rated voltage, said second filament being designed to operate at a second rated voltage, said second rated voltage being higher than said first rated voltage; and

(b) an operating circuit outside of said envelope including:

(i) an inductive reactance electrically coupled with said first lead-in wire;

(ii) voltage-detection means for measuring the operating voltage across said lead-in wires of said lamp; and

(iii) means for coupling with an external source of electrical power;



(c) whereby a measurement by said voltage-detection means which returns a value equal to said first rated voltage indicates that both of said filaments are operating and a measurement by said voltage-detection means which returns a value equal to said second rated voltage indicates that said first filament has failed and only said second filament is operating.

4,841,197

DOUBLE-CHAMBER ION SOURCE

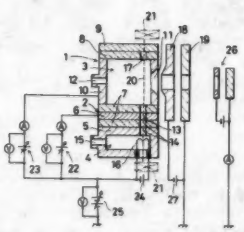
Kazuo Takayama, Machida; Eiji Yabe, Shimizu; Kenichi Takagi, Chigasaki; Ryota Fukui, Hatano, and Riichi Kikuchi, Chigasaki, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed May 27, 1987, Ser. No. 55,804

Claims priority, application Japan, May 28, 1986, 61-121283; May 28, 1986, 61-121284; May 28, 1986, 61-121285; May 30, 1986, 61-123652; May 30, 1986, 61-123653; Jul. 19, 1986, 61-169047

Int. Cl.[4] G01T *1/20;* **H01J** *27/00*

U.S. Cl. 315—111.81 **10 Claims**



1. An ion source for producing ions by means of a plasma comprising:

an electric discharge chamber body,

a partition wall dividing an interior space of said body into a main discharge chamber and a subsidiary discharge chamber,

a filament mounted in said subsidiary discharge chamber,

an anode electrode provided in said partition wall, said partition wall and said anode electrode each having at least one small opening therethrough which are aligned

and communicate said subsidiary discharge chamber with said main discharge chamber and are sized for jetting of a plasma into said main discharge chamber,

and subsidiary discharge chamber having a rare, inert gas introducing opening therein,

said main discharge chamber having an electric discharge gas introducing opening therein and an ion outlet opening therein, the gas pressure in said subsidiary discharge chamber being kept higher than the gas pressure in said main discharge chamber, and

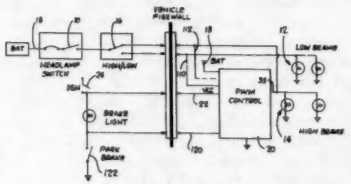
magnet means provided adjacent an outside surface of said body for creating a magnetic field extending nearly along an axis of said at least one small opening of said anode electrode enhancing the jetting of the plasma into said main discharge chamber.

4,841,198

HEAD LAMP CONTROL METHOD AND APPARATUS, WITH PWM OUTPUT REGULATION

Daniel D. Wilhelm, Reed City, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Oct. 19, 1987, Ser. No. 109,917
Int. Cl.[4] B60Q *1/02*
U.S. Cl. 315—82 **9 Claims**



1. Apparatus for energizing a motor vehicle lamp at a designated power level comprising:

(a) a battery for energizing said motor vehicle lamp with a battery output signal;

(b) modulating means powered by said battery through a vehicle ignition switch for modulating the battery output signal and energizing the head lamp at the designated power level during operation of the motor vehicle; and

(c) monitoring means for sensing a modulated energization signal coupled to the head lamp and adjusting modulation of the energization voltage to maintain the designated power level of lamp energization as the battery output signal changes during motor vehicle operation.

4,841,199

ELECTRICAL SYSTEM FOR VEHICLE DAYTIME RUNNING LIGHTS

Tsutomu Irie, Hamilton, Canada, assignor to See-Me Lights Corp., Hamilton, Canada

Filed Feb. 3, 1988, Ser. No. 151,979
Int. Cl.[4] H05B *37/00*; B60Q *1/02*
U.S. Cl. 315—83 **6 Claims**

4. A headlight circuit for a vehicle, said vehicle having an engine and right and left side headlights including low and high beam filaments having first and second contact points between which an electrical potential may be applied to induce said filaments to emit light, and comprising in combination:

means for electrically connecting first contact points of each of said low beam filaments;

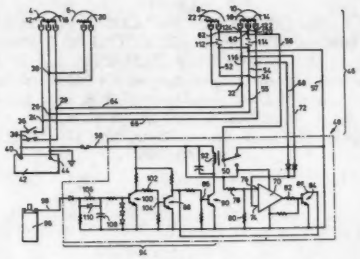
means for electrically connecting first contact points of each of said high beam filaments;

means for selectively connecting said first contact points of said low beam filaments to a power source;

means for selectively connecting said first contact points of said high beam filaments to a power source;

means for connecting second contacts of the low and high beam filaments on a first side of the vehicle to a point of common potential;

means for connecting second contacts of the low and high beam filaments on a second side of the vehicle to switching means;



said switching means being adapted to assume a first state establishing an electrical connection to said point of common potential or a second state establishing an electrical connection to said power source;

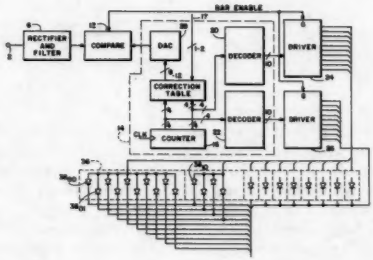
means for establishing said second state only when the engine is running and the first contacts of neither the low or high beam filaments are connected to said power source.

4,841,200

CIRCUIT FOR DRIVING A MULTIPLE-ELEMENT DISPLAY

Edward J. Cleary, Jr.; Mike R. Coleman, both of Beaverton, Oreg., and Michael R. Jones, Brea, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 850,198, Apr. 10, 1986, abandoned.
This application Oct. 5, 1987, Ser. No. 106,995
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—363 **9 Claims**



1. A circuit for driving a display device having n display elements, where n is a positive integer greater than 1, comprising:

a device for providing a repetitive digital signal having a predetermined sequence of n digital values,

conversion means for converting the digital signal to analog form in accordance with a predetermined transfer function,

comparison means for comparing the magnitude of the analog signal with the magnitude of a second signal and providing a display enable signal in the event that the magnitude of the analog signal bears a predetermined relationship to the magnitude of the second signal, and

decoder means having a plurality of output terminals at

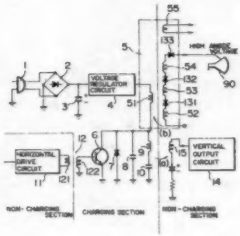
which n distinct output signals, corresponding respectively to said n digital values, are provided, said decoder means being responsive to the display enable signal for providing one of the n output signals to the corresponding one of the n display elements when the decoder means receives the corresponding one of the n digital values.

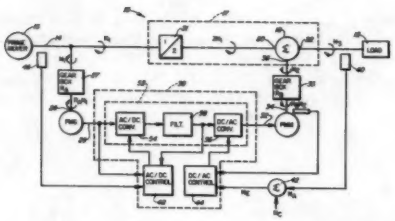
4,841,201

DISPLAY DEVICE INCLUDING FLYBACK TRANSFORMER CONSTRUCTED TO CONTROL LEAKAGE CURRENTS

Kazuyoshi Takizawa, Hiratsuka, and Kiyoshi Watanuki, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 4, 1987, Ser. No. 116,343
Claims priority, application Japan, Nov. 14, 1986, 61-173941
Int. Cl.[4] H04N *3/195*
U.S. Cl. 315—411 **8 Claims**





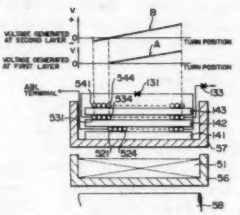
1. A display device comprising:
a cathode ray tube;
a flyback transformer including a primary winding which is dc-wise connected to a commercial power source and a secondary winding which is dc-wise insulated from said primary winding and which generates a high voltage for an anode of said cathode ray tube;
a charging section which includes a horizontal deflection coil dc-wise connected to said primary winding, but does not include said primary winding; and
a non-charging section which includes a vertical deflection coil dc-wise insulated from said primary winding, but not said secondary winding;
wherein said secondary winding includes a first layer winding and a second layer winding wound concentrically on said first layer winding, the winding start position of said first layer winding being shifted from the winding start position of said second layer winding toward the winding end side thereof by an amount such that a difference between a current leaking from said charging section into a said non-charging section and a current leaking from said secondary winding into said primary winding is not larger than 1 mA RMS, and the winding end position of said first layer winding extending at least to the winding end position of said second layer winding.

4,841,202

SPEED-LIMITED ELECTRICALLY COMPENSATED CONSTANT SPEED DRIVE

Bryan W. Dishner, Roscoe; Vijay K. Maddali, Rockford, and P. John Dhyanchand, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 28, 1987, Ser. No. 138,344
Int. Cl.[4] H02P *9/00*
U.S. Cl. 318—14 **8 Claims**



1. An electrically compensated constant speed drive (ECCSD) for developing constant-speed motive power at a drive output shaft from variable-speed motive power provided by a prime mover at an ECCSD input shaft wherein the speed of the input shaft is limited so that such speed is equal to or less than the speed required to maintain the drive output shaft at a desired speed, comprising:
a differential having a first input coupled to the input shaft, a second input and an output coupled to the output shaft;
a permanent magnet generator (PMG) having a motive power shaft coupled to the input shaft and electrical power windings which develop AC power;
a permanent magnet motor (PMM) having a motive power shaft coupled to the second differential input and electrical power windings;
an AC/DC converter coupled to the electrical power windings of the PMG for developing a DC voltage on a DC link from the AC power developed by the PMG;
a DC/AC converter coupled between the AC/DC converter and the electrical power windings of the PMM for developing AC power from the DC power developed by the AC/DC converter to operate the PMM;
a first control means for controlling the AC/DC converter responsive to an operating parameter of the PMG; and
a second control means operationally independent of the first control means for controlling the DC/AC converter whereby the PMM develops compensating motive power at a speed sufficient to maintain the drive output shaft at the desired speed.

4,841,203

ELECTRIC TROLLING MOTOR STEERING SYSTEM

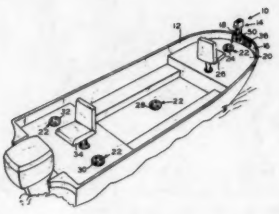
David A. Gilbert, 76542 Meadow Way, Oak Ridge, Oreg. 97463

Filed May 31, 1988, Ser. No. 200,728
Int. Cl.[4] B63H *21/26*
U.S. Cl. 318—53 **6 Claims**

1. A steering system for electric trolling motors, which comprises:
a steering shaft, axially rotating within a steering shaft housing having boat attachment means, the steering shaft having a first end extending above the steering shaft housing and a second end extending below the steering shaft housing and attached to an electric motor with propeller;
a base member mounted on top of the steering shaft housing;
a direct current electrical power source;
an electric gearhead motor mounted on the base member, and having an output shaft extending therefrom;
a spline gear formed on the first end of the steering shaft;

an output gear attached to said output shaft from the gearhead motor, and interconnected to said spline gear;

a plurality of remote steering station members, each steering station member comprising a base plate and three electric push switches installed thereon; wherein a first push switch is electrically connected to and energizes said electric motor with propeller; a second push switch is electrically connected to and energizes the gearhead motor thereby rotating, through said gearing, the steering shaft and thus the electric motor with propeller in a first



direction; and a third push switch which energizes the gearhead motor similar to the second push switch but with polarity reversed, so as to rotate the steering shaft and the electric motor with propeller in a second and opposite direction;

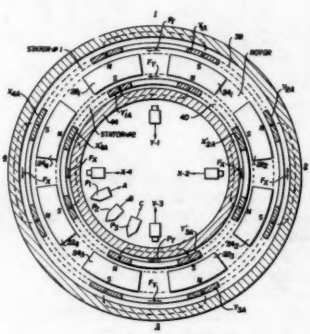
said three switches being installed on said base plate in a spaced triangular relationship so that placement of a user's foot will energize said first push switch; and tilting of the foot to the right will also energize the second push switch, or tilting of the foot to the left will also energize said third push switch.

4,841,204

COMBINATION ELECTRIC MOTOR AND MAGNETIC BEARING

Philip A. Studer, 10313 Ridgemoore Dr., Silver Spring, Md. 20901

Filed Oct. 7, 1987, Ser. No. 105,256
Int. Cl.[4] F16C *39/06*; H02K *7/09*
U.S. Cl. 318—254 **7 Claims**



1. A combined electric motor and magnetic bearing, therefor, comprising:

an annular rotor including a plurality of alternately poled permanent magnets arranged in a ring of equally spaced pairs;

an armature including two annular segmented stator coil assemblies, one of said stator coil assemblies being located interiorally of said rotor for producing radial forces and the other of said stator coil assemblies being located exteriorally of said rotor for producing torque couples on the rotor, each of said stator coil assemblies further comprising a plurality of mutually opposing pairs of stator coils located in relatively close proximity to the rotor, said stator coils having separated core portions providing current conduction in mutually opposite directions which interacts with a flux from a respective pair of adjacent alternately poled magnets of said plurality of alternately poled magnets to produce forces on said rotor in a predetermined direction;

means for energizing said other stator coil assembly to produce torque couples in the same direction on the rotor to produce rotation thereof;

means for sensing displacement of said rotor along two mutually orthogonal axes coincident with a central rotational axis of said rotor; and

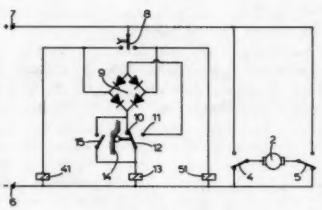
means responsive to said sensing means for energizing said one coil assembly to produce pairs of like directed radial forces along said axes which produce a resultant radial force to center and support said rotor about said rotational axis.

4,841,205

CONTROL DEVICE FOR A MOVABLE PART, DESIGNED FOR OPENING AND CLOSING AN OPENING, ESPECIALLY A SLIDING/TILTING ROOF FOR A VEHICLE

Jeen Bekkema, Venlo, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Jan. 20, 1988, Ser. No. 146,253
Claims priority, application Netherlands, Jan. 23, 1987, 8700159
Int. Cl.[4] H02P *5/00*
U.S. Cl. 318—282 **2 Claims**



1. A control device for a movable part designed for opening and closing an opening, especially a sliding/tilting roof of a vehicle, comprising:

a motor for driving the movable part and having terminals for connection to different poles of a power source;

a pole reversing switch for selectively connecting the terminals of the motor to said different poles of the power source;

a control member driven by the motor;

a first switch actuated by said control member for interrupting the connection of the terminals of the motor with the poles of the power source when the movable part reaches a closed position;

a second manually operable switch with a normally assumed non-connected rest position and first and second connected positions;

first and second relays, associated with the pole reversing switch;

said pole reversing switch including a separate make-and-break contact connected to each terminal of the motor and controlled by one of the relays, respectively, which make-and-break contacts each connect the corresponding terminal of the motor with one pole of the power source when the corresponding relay is not excited and with the other pole of the power source when the corresponding relay is

excited, first ends of the excitation windings of both relays being connected with the one pole of the power source and second ends of the excitation windings being alternately connectable with the other pole of the power source through the respective connected positions of said second manually operable switch; and

a switching circuit, in which the first switch is connected, and which first switch, when the movable part reaches the closed position upon actuation of the manually operable switch to a connected position for one relay, connects the excitation winding of the other relay with the other pole of the power source for connection of both poles of the motor to the other pole of the power source.

4,841,206

SPEED CONTROL DEVICE FOR AN ELECTRONIC SEWING MACHINE

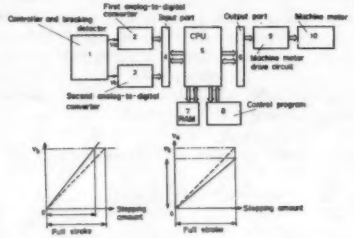
Akira Orii, and Takeshi Kongo, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,640

Claims priority, application Japan, Mar. 24, 1987, 62-67870

Int. Cl.[4] D05B *69/36*

U.S. Cl. 388—828 **12 Claims**



1. A speed control device for a sewing machine, comprising:

a controller/break circuit including a variable resistor for speed control and a break detection resistor for break detection, said variable resistor having a plurality of terminals, both of said resistors being electrically connected to each other, said controller/break circuit also including comparing means for comparing values indicative of a variable potential of said variable resistor and of a break detection potential of said break detection resistor with a predetermined set value of a correspoonding potential so as to thereby detect a break of at least one of any of the terminals and consequently slow a rotation speed of the sewing machine instantly down to zero.

9. A method for controlling speed of a sewing machine that has a motor, comprising the steps of:

ascertaining values indicative of a variable potential of a variable resistor and a break detection potential of a break detection resistor;

detecting a break of at least one of any of a plurality of terminals of said variable resistor by comparing the ascertained values with a predetermined set value of a corresponding potential; and

slowing a rotation speed of the sewing machine motor instantly down to zero in response to the detected break.

4,841,207

PULSE WIDTH MODULATED CONTROL METHOD AND MEANS

Neil G. Cheyne, St. Helens, New Zealand, assignor to Fisher & Paykel, Auckland, New Zealand

Continuation of Ser. No. 709,043, Mar. 7, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 88,657

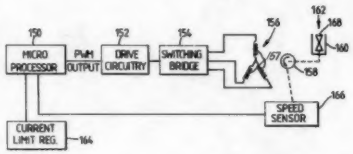
Claims priority, application New Zealand, Mar. 8, 1984, 207431; Mar. 8, 1984, 207430

Int. Cl.[4] H02P *5/16*

U.S. Cl. 388—811 **31 Claims**

1. A pulse width modulated method, using at least one power switch having "on" and "off" states for providing, respectively, low and high impedance paths between an inductive load and a source of power, thereby controlling the current flow through the inductive load during a sequence of regular reoccurring time periods, and wherein the at least one power switch is switched to the "on" state during a plurality of the time periods causing a current flow, the method comprising the combination of steps, operative during any one of a plurality of the time periods, of:

switching the at least one power switch from the "on" state to the "off" state when a predetermined level of current



flow has been reached flowing in one of, the inductive load and the at least one power switch; and

switching the at least one power switch back to the "on" state after the "off" state in the same time period as the "off" state occurred, independent of the occurrence of the beginning of a time period and, if the off state exists at the end of the time period, then at the beginning of the next time period.

4,841,208

POSITION CONTROL SYSTEM INCLUDING A QUICK RESPONSE CONTROL

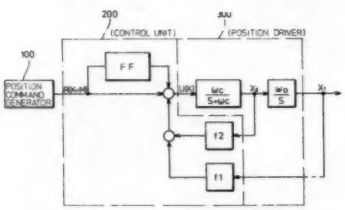
Hiroshi Itoh, Numazu, Japan, assignor to Toshiba Kikai Kabushi Kaisha, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,110

Claims priority, application Japan, Sep. 11, 1986, 61-214741; Apr. 7, 1987, 62-86649

Int. Cl.[4] G05B *13/02;* **B29C** *47/92*

U.S. Cl. 318—561 **4 Claims**



1. A position control system comprising:

position command generating means for generating a position command at a prescribed sampling time k for a time k+M which is at least one sampling cycle M ahead of the prescribed sampling time;

a controlled object including a speed control loop, and control means for generating a control input value determined by determining a weight coefficient of each of position commands at sampling times k+l, (l=1, 2, . . . , M) and a weight coefficient for the position and speed which are outputs of the controlled object in order to minimize the value of an evaluation function so that the position command at said prescribed sampling time k and the position of the controlled object will be equalized, while the position commands produced by said position command generating means at the sampling times k+l (l=1, 2, . . . M), the position and speed of the controlled object, and a control input to be applied to said controlled object are being used as variables, wherein the state equa-

tion of said controlled object in a discrete-time system is expressed by:

$$X_{(k+1)}=\Phi \cdot X_{(k)}+G \cdot U_{(k)},$$

and a control input vector for minimizing the evaluation function:

$$J_{c(k)} = [R_{O(k+M)} - X_{(k+M)}]^T \cdot F_M \cdot [R_{O(k+M)} - X_{(k+M)}] + \sum_{j=k}^{K+M} \{[R_{O(j)} - X_{(j)}]^T \cdot Q[R_{O(j)} - X_{(j)}] + U_{(j-1)}^T \cdot H_{(j-i-k)} \cdot U_{(j-i)}\}$$

which evaluates the difference between a status variable vector $X_{(k)}$ of said controlled object and a position command vector $R_{O(k)}$ is generated at the prescribed sampling time k, while the position command vectors $R_{O(k+1)}$, $R_{O(k+2)}$, . . . , $R_{O(k+M)}$ generated by said position command generating means from a sampling time k+1 to a sampling time k+M which is M steps ahead of the sampling time k+1 are being used as variables,

where

$X_{(k)}$: the status variable vector (n×1) of the system,

Φ: the coefficient matrix (n×n) of the controlled object,

G: the input matrix (n×m),

$U_{(k)}$: the control input vector (m×i),

$R_{O(k)}$: the enlarged position command signal (n×1), F_M: the final matrix (n×n),

Q: the positive semi-definite symmetric matrix (n×n),

$H_{(i)}$: the positive definite symmetric matrix (m×m),

i=1, . . . , M (M is a predictive period, i.e., the number of sampling times).

4,841,209

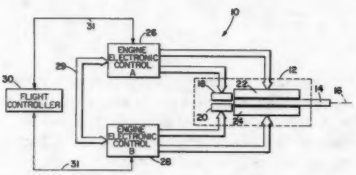
ACTUATOR CONTROL SYSTEM WITH DISPLACEMENT SENSOR FAULT DETECTION

Demetrius J. Poumakis, West Paulm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 25, 1987, Ser. No. 125,364

Int. Cl.[4] G05B *9/03*

U.S. Cl. 318—564 **4 Claims**



1. A detection system for use in determining failure of a linear variable phase transducer (LVPT) displacement sensor that includes a plurality of primary electrical windings receiving excitation signals for producing magnetic fluxes at different phases in a displaceable core, and a secondary electrical winding providing signals indicative of the summed magnetic flux in the core, said system comprising:

means for sensing said primary winding excitation signals;

means for sensing voltage and phase of the secondary winding signals;

detector means for receiving said sensed signals including;

means for determining a magnitude of the relative phase between said primary excitation signals and said secondary winding signals;

means for computing a displacement signal value in dependence on said relative phase magnitude; and

means having associated therewith a plurality of predetermined ranges of signal values corresponding to each of said displacement signal values for comparing the secondary winding signal voltage value with the corresponding one of said predetermined ranges of signal values, said comparing means capable of formulating each of said value ranges with different magnitudes, and further for providing fault signals if said secondary winding signal voltage value is not within said value range.

4,841,210

INDUSTRIAL ROBOT CONTROL DEVICE

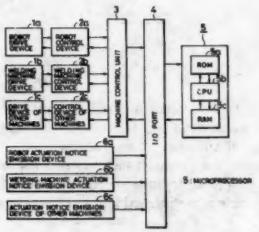
Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,130

Claims priority, application Japan, Feb. 16, 1987, 52-32698

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568.24 **6 Claims**



1. A control device for controlling a plurality of machines including industrial robots, which are provided in a single production line comprising:

means for producing a prior notice of actuation for each of said machines a predetermined period of time before the actuation of each of said machines;

means for calculating a total amount of voltage drops caused by the actuations of said machines to which the prior notices of actuation have been issued;

means for detecting whether the total amount of voltage drops is lower than a predetermined allowable value;

means for determining drive order and drive timing of said machines according to priorities which have been given to said machines, respectively, when it is detected by said determining means that the total amount of voltage drops exceeds the predetermined allowable value; and

means for driving said machines according to outputs of said determining means.

4,841,211

METERING METHOD OF INJECTION MOLDING MACHINE

Noriaki Neko, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP86/00604, § 371 Date Jul. 9, 1987, § 102(e) Date Jul. 9, 1987, PCT Pub. No. WO87/03245, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 26, 1986, Ser. No. 81,458

Claims priority, application Japan, Nov. 27, 1985, 60-265125

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—569 **5 Claims**

1. A method for metering resin in an injection molding machine, comprising the steps of:

(a) controlling the injection molding machine by means of a numerical controller;

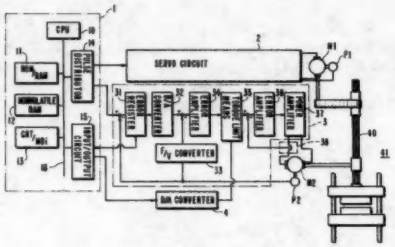
(b) using a servo motor as a drive source for driving a screw in an axial direction;

(c) performing injection of the resin via the screw;

(d) during metering, applying a torque limit corresponding to the back pressure to said servo motor, to control an output of said servo motor to a torque of the back pressure;

(e) during metering, reading via said numerical controller a

value of an error register in a servo circuit which drives said servo motor, and adding the readout value to said error register after a sign of the readout value is inverted, to thereby perform follow-up so as to set the value of said error register to 0;



(f) during metering, detecting an axial position of said screw from the value read out from said error register, thereby detecting the metering point; and

(g) after the screw position has reached the metering point, canceling the torque limit and driving said servo motor so that the screw is positioned and held at the metering point.

4,841,212

ELECTROMAGNETIC BEARING CONTROL APPARATUS

Osami Matsushita, Taira; Michiyuki Takagi, Ushiku; Mitsuho Yoneyama, Tiyoda; Toyomi Sugaya, Shimoinayoshi, and Ikuhiro Saito, Simoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

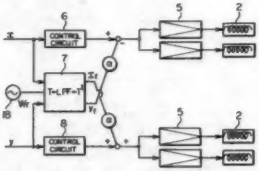
PCT No. PCT/JP87/00342, § 371 Date Aug. 12, 1987, § 102(e) Date Aug. 12, 1987, PCT Pub. No. WO88/02073, PCT Pub. Date Mar. 24, 1988

PCT Filed May 28, 1987, Ser. No. 102,561

Claims priority, application Japan, Sep. 12, 1986, 61-213903

Int. Cl.[4] G05B *1/01*

U.S. Cl. 318—607 **7 Claims**



1. An electromagnetic bearing control apparatus having means for detecting orthogonal x and y-component signals of radial displacement of a rotor, and servo-circuit means for controlling currents being supplied to electromagnetic coils in accordance with the displacement x and y-component signals from said detecting means such that said rotor is held in a predetermined radial position, said servo-circuit means comprising:

an x-component control circuit for processing said displacement x-component signal;

a y-component control circuit for processing said displacement y-component signal;

selective extraction means for extracting a frequency component to be controlled from said displacement x and y-component signals; and

means for supplying said displacement x and y-component signals to said selective extraction means, for adding one component of x and y-component signals of said frequency component delivered out of said selective extraction means to the other component of the processed displacement x and y-component signals delivered out of the other of said x and y-component control circuits, and for subtracting the other component of x and y-component signals of said frequency component delivered out of said selective extraction means from one component of said processed displacement x and y-component signals delivered out of one of said x and y-component control circuits;

wherein said selective extraction means comprises a band-pass filter which coincide with a frequency of a self-excited vibration generated as said rotor rotates.

4,841,213

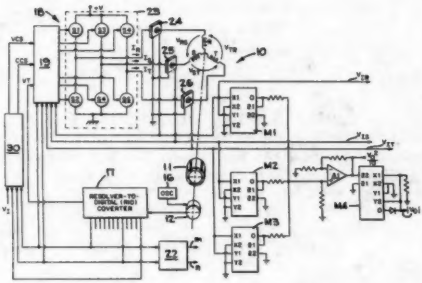
CURRENT AND TORQUE FEEDBACK SYSTEM AND CIRCUITRY FOR SINE-WAVE CONTROLLED BRUSHLESS SERVO DRIVE SYSTEMS

Jaroslav Tomasek, Plymouth, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 1, 1988, Ser. No. 176,536

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—661 **8 Claims**



1. A current and torque feedback system for use with a sine-wave controlled brushless servo motor having a plurality of stator windings, a permanent magnet rotor and a rotor position sensor for developing sensor signals which indicate the rotary position of said motor rotor, said motor being connected to a servo amplifier for synthesizing and delivering sinusoidal electrical currents to said stator windings, said system comprising:

current sensing means for sensing instantaneous values of curents in each of said stator windings;

means responsive to said current sensing means for computing peak values of said currents in said stator windings;

means responsive to said current sensing means for sensing simultaneously and independently the electrical polarity of the current in each of said stator windings;

means using said sensor signals for dividing the electrical revolution of said brushless motor into a number of regions equal to the number of phases of said brushless motor with each of said regions centered at a corresponding one of the positions of peak values of said currents; and

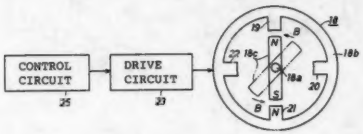
means using said sensor signals, said peak values of said currents and said current polarities for generating an output signal having a value proportional to said peak values of said currents and having a polarity indicative of the direction of the torque generated by said brushless motor.

4,841,214

CONTROL DEVICE FOR A STEPPING MOTOR

Michio Ueda, Gamagori, and Satoshi Shibata, Chita, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 29, 1987, Ser. No. 139,205
Claims priority, application Japan, Dec. 30, 1986, 61-199093[U]
Int. Cl.[4] H02P 8/00
U.S. Cl. 318—696 7 Claims



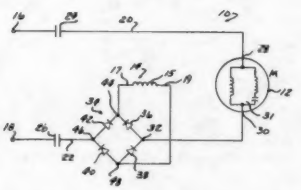
1. A control device for a stepping motor comprising:
drive means connected to and driven by the stepping motor and including a resilient member which is restored in a direction opposite to its previous driven direction due to its resiliency when the driving force of a rotor of the stepping motor is interrupted, a restraining force for holding the rotor of the stopped stepping motor being smaller than a resilient force applied to the rotor of the stepping motor due to the resiliency of the resilient member; and
stop control means for controlling the stepping motor by outputting a reverse control signal which rotates the stepping motor at least a minimum step in a direction opposite to a previous direction of rotation so as to offset the resiliency of the member when the previous rotation stops, thereby avoiding stepout of the stepping motor.

4,841,215

D.C. SOLENOID CONTROL CIRCUIT

Stephen P. Verbos, Spring Lake, Mich., assignor to Lift Tech International Inc., Muskegon, Mich.

Filed Jun. 22, 1987, Ser. No. 65,333
Int. Cl.[4] H02P 3/18
U.S. Cl. 318—757 5 Claims



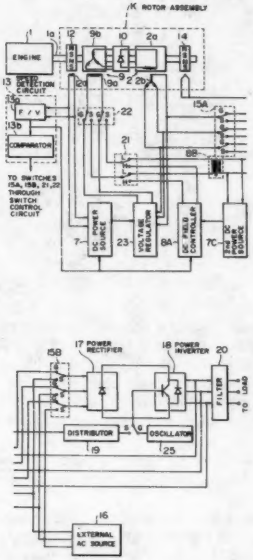
1. A control apparatus comprising: an A.C. motor with first and second input leads;
a D.C. solenoid having a winding, the solenoid operating a device;
a source of A.C. electrical power;
means, responsive exclusively to the flow of A.C. current through the motor, for converting the A.C. current to a D.C. current, the converting means providing an A.C. current path and a D.C. current path;
means for exclusively supplying A.C. electrical power to the A.C. motor, the A.C. power supplying means including:
the A.C. electrical power source connected to first and second terminals;
a first conductor connected to the first terminal and one of the A.C. motor leads;
a second conductor connected to the second terminal;
the other lead of the A.C. motor being connected solely through the A.C. current path provided by the converting means and the second conductor to the second terminal;
the D.C. current being supplied exclusively to the winding of the D.C. solenoid;
the D.C. solenoid being connected in series with the D.C. current path of the converting means.

4,841,216

ENGINE START TYPE VSCF GENERATING SYSTEM

Yoshimi Okada; Masao Kimura, and Kazuo Okubo, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,518
Claims priority, application Japan, Jul. 24, 1987, 62-183489
Int. Cl.[4] F02N 11/04, 11/08
U.S. Cl. 322—10 6 Claims



1. An engine start type VSCF generating system for converting a varible speed shaft output of an engine to AC power of a constant voltage at a constant frequency, comprising:
an AC exciter having a rotor winding and a field winding;
a rotary rectifier for rectifying an output of said AC exciter to a direct current:
a main generator constituted by an AC generator having a rotary field winding and an armature winding, said rotary field winding being excited by the direct current from said rotary rectifier;
said rotor winding of said AC exciter, said rotary rectifier, and said rotary field winding of said main generator being mounted on a common shaft of said engine;
a power rectifier for converting an AC output of said main generator to DC power;
a power inverter connected to said power rectifier for converting a DC output of said power rectifier to an AC power;
position sensor means mounted on the common shaft of said engine for detecting a rotational position of said rotary field winding of said main generator;
a filter connected to said power inverter for removing noise in the AC output power thereof;
switching means for connecting an input of said power

rectifier to an external AC power source, and for connecting an output of said power inverter to said armature winding of said main generator by disconnecting said filter thereby to drive said main generator as a no-commutator motor at the time of starting of said engine; and

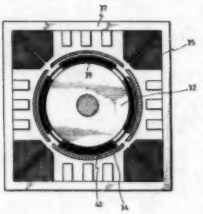
a distributor connected to said position sensor means and said power inverter for controlling commutation of said power inverter based on a position detection signal from said position sensor means.

4,841,217

PULSED GENERATOR INCORPORATING OUTPUT WAVEFORM FLEXIBILITY AND A PULSED TRANSFORMER

William F. Weldon; Siddharth B. Pratap, and Mircea D. Driga, all of Austin, Tex., assignors to The University of Texas System, Austin, Tex.

Filed Dec. 14, 1987, Ser. No. 132,596
Int. Cl.[4] H02K *39/00*
U.S. Cl. 322—8 **18 Claims**



1. A pulsed alternator for sequentially supplying short duration pulses of electrical power to a load circuit, where said alternator includes a stator or rotor each having an inner or outer periphery, said alternator comprising:

an armature coil mounted on the inner or outer periphery of the stator or rotor, said load circuit being connected to said armature coil;

a field coil mounted on the rotor when the armature coil is on the stator and on the stator when the armature coil is on the rotor;

a compensating coil mounted about the inner or outer periphery of said stator or rotor, said compensating coil coupled to said armature coil solely by mutual inductance or magnetic coupling, and;

an external trigger switch coupled between said armature coil and said load circuit, said switch adapted to be periodically and sequentially opened and closed to provide said pulses to said load circuit.

4,841,218

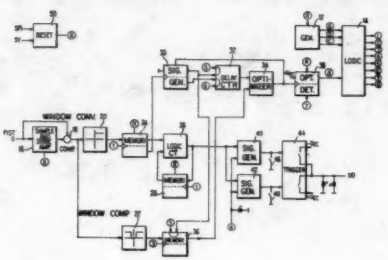
ELECTRONIC CONTROLLER AND A SYSTEM AND METHOD FOR OPTIMIZING GENERATION OF ELECTRICAL POWER UTILIZING THE SAME

Meir Rosinnes, Ra'Anana, Israel; Hugo Stadler, Ruhstorf/Rott, and Siegfried Strunz, Pocking, both of Fed. Rep. of Germany, assignors to Amin Engineers Ltd., Israel and Loher Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,377
Claims priority, application Israel, Jan. 30, 1987, 81437
Int. Cl.[4] H02P *9/00*
U.S. Cl. 322—24 **8 Claims**

1. In a system comprising an asynchronous generator rotatable at variable speeds, and a main electrical network carrying power at a substantially constant voltage and frequency, the improvement comprising:

a synchronizer having an electronic optimization controller, said synchronizer being connected in a circuit between said generator and said network for receiving electrical power at variable voltages and frequencies from said generator and for controllably and continuously injecting



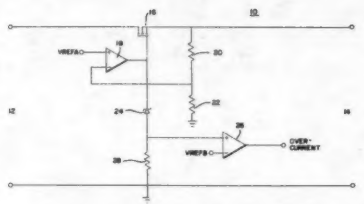
said power into said network at substantially constant voltage and frequency.

4,841,219

LOSSLESS OVERCURRENT SENSING CIRCUIT FOR VOLTAGE REGULATOR

Kevin J. Lonergan, Palmer Lake, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 10, 1988, Ser. No. 192,686
Int. Cl.[4] G05F *1/44*
U.S. Cl. 323—274 **5 Claims**



1. An overcurrent sensing circuit for voltage regulators comprising:

at least a first voltage regulator circuit including:

(a) an input;

(b) an output;

(c) a field effect transistor having a source, a drain, and a gate, and being disposed between said input and said output so that current can flow from said input through the drain and the source to said output; and,

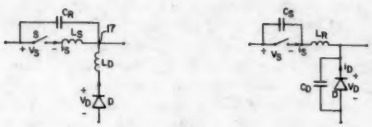
(d) voltage feedback means connected between said output and a first input of an amplifier circuit, said amplifier circuit generating as an output, a control voltage that is fed to the gate of the field effect transistor, said control voltage being responsive to the circuit output voltage; and,

means to sense when the magnitude of said control voltage exceeds a set point at which said field effect transistor is driven into saturation thereby, said point being indicative of an overcurrent condition between said input and said output.

4,841,220
DC-TO-DC CONVERTERS USING MULTI-RESONANT SWITCHES

Wojciech A. Tabisz, 6700 H. Terrace View, and Fred C. Lee, 2909 Stradford Ln., both of Blacksburg, Va. 24060

Filed Sep. 23, 1987, Ser. No. 99,965
Int. Cl.[4] G05F 1/56; H02M 3/335
U.S. Cl. 323—282 11 Claims



1. A multi-resonant converter for converting a DC input signal from a supply to a DC output signal to be imposed across a load, said device comprising:

an input stage for receiving the DC input signal;

an output stage for imposing said DC output signal across the load;

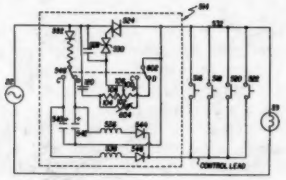
an active switch and a passive switch interposed between said input and output stages; and

reactive means for causing said active and passive switches to act together as a multi-resonant switch.

4,841,221
POSITION-SENSING CIRCUIT

Jonathan A. Barney, Whitehall, and Arjuna R. Karunaratne, Allentown, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 27, 1988, Ser. No. 186,517
Int. Cl.[4] G05F 5/02; G01R 27/02
U.S. Cl. 323—320 15 Claims



1. A bistable position-sensing circuit comprising:

(a) an elongated first electrically-conductive element having first and second segments,

(b) a second electrically-conductive element, movable along the length of said first element, while maintaining electrical contact with said first segment, said second segment, or both segments,

(c) a first energy-storage element electrically connected to said second element, and

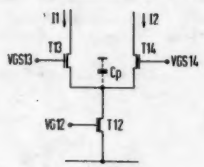
(d) a second energy-storage element electrically connected to said first segment and to said first energy-storage element,

whereby a time constant of said circuit undergoes a stepwise change when said second element is positioned to contact both segments of said first element.

4,841,222
SWITCHED CURRENT SOURCE

Rudolf Koch, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 9,251
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603241
Int. Cl.[4] G05F 3/26
U.S. Cl. 323—311 6 Claims

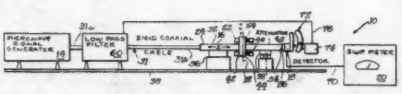


1. Switched current source, comprising at least two branches, at least one MOS current source transistor connected in common to each of said at least two branches, and at least two MOS switching transistors each being connected in a respective one of said branches and simultaneously forming an additional current source transistor, said at least one current source transistor being connected as a respective cascode with each of said at least two switching transistors.

4,841,223
METHOD AND APPARATUS FOR MEASURING FIBER ORIENTATION ANISOTROPY

Gary A. Baum, and Charles C. Habeger, Jr., both of Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis.

Filed Jun. 17, 1987, Ser. No. 63,580
Int. Cl.[4] G01R 27/04; G01B 5/16
U.S. Cl. 324—58.5 A 16 Claims



1. Apparatus for measuring fiber orientation anisotropy in a web of fibrous material that has a machine direction and a cross direction, the apparatus comprising:

a waveguide having a first end and a second end and gripping means between said ends for insertion of a specimen of the web in a plane normal to the waveguide axis and alternately with its machine direction aligned in each of two orientations,

a microwave signal generator for generating a test signal at a single, constant frequency,

conduit means for conducting a generated microwave test signal from signal generator to said first end of said waveguide so as to propagate the microwave test signal from said first end to said second end with an electric field established in one of the perpendicular directions,

detector means at said second end having a narrow band sensitivity for receiving a preferentially filtered constant frequency test signal propagated through said waveguide (1) with the waveguide empty of said specimen, (2) with the microwave signal attentuated by said specimen oriented in the first of said orientations and (3) with the specimen oriented in the second of said orientations, said detector means rectifying said received microwave signal

to produce an electrical signal proportional to the intensity of the microwave signal received thereby.

waveguide attenuator means disposed in said waveguide between said gripping means and said detector for preferentially filtering reflected waves from the propagated microwave test signal, and

metering means for receiving the electrical signal from said detector means and evaluating the intensity thereof.

4,841,224

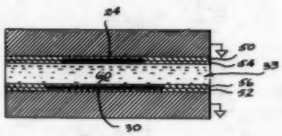
GAP WIDTH PROBE AND METHOD

James D. Chalupnik; Joseph L. Garbini, and Jens E. Jorgensen, all of Seattle, Wash., assignors to Washington Technology Center, Seattle, Wash.

Filed Nov. 10, 1987, Ser. No. 119,748

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 P **12 Claims**



1. A probe for use with detection circuitry for measuring the distance between two surfaces, comprising:

an inflatable bladder having means for forming an interior cavity, said means including first and second bladder sides that may be substantially adjacent and parallel to one another when said bladder is uninflated such that the probe thickness is minimized, said bladder being suitable for insertion between the surfaces;

means for inflating said cavity such that said first and second sides move away from one another, whereby said bladder can be inserted between the surfaces and inflated such that said sides are in contact with the surfaces; and

distance measuring means for measuring the distance between said sides when said cavity is inflated, to thereby determine the distance between the surfaces.

4,841,225

CAPACITIVE SENSOR FOR MEASURING A DISPLACEMENT

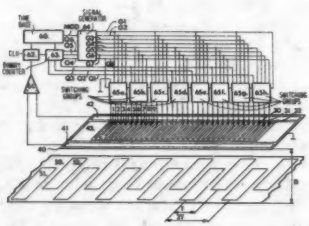
Hans U. Meyer, 42, rue de Lausanne, 1110 Morges, Switzerland

Filed Sep. 28, 1987, Ser. No. 102,042

Claims priority, application Switzerland, Nov. 13, 1986, 4535/86-7

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 R **2 Claims**



1. Capacitive sensor for measuring a displacement between a scale and a slide movable relative to one another and facing each other, the scale comprising a series of receiving electrodes having a pitch T along the direction of displacement, the slide comprising a series of emitting electrodes having a pitch T/N in the direction of displacement, characterized in that the series of emitting electrodes is electrically divided in M groups of N adjacent electrodes, signal generator means having, said outputs having ZN signal configurations, 2N outputs for generating on each group one of two signal distributions each having the same spatial period, the first signal distribution being that obtained by connecting N of the outputs of said signal generator means directly to said emitting electrodes, the other signal distribution being derived from the first signal distribution by switching groups connected between each group of electrodes and the outputs of said generator means, said switching groups shifting the first signal distribution along the direction of displacement, and a control circuit being provided for weighting each group and for switching each group from one signal distribution to the other, whereby when a signal distribution overlaps into an adjacent group following shifting, the distribution is governed by the weighting provided by said control circuit, thus providing preference between overlapped signal distributions.

4,841,226

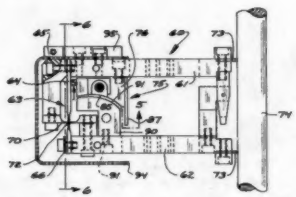
CAPACITIVE EXTENSOMETER WITH CURVED TARGET SURFACE

Harry R. Meline, Minnetonka, and Eric L. Paulsen, Wayzata, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 893,799, Aug. 6, 1986. This application Oct. 1, 1987, Ser. No. 103,538

Int. Cl.[4] G01R *27/26;* **G01L** *1/00;* **G01B** *5/00*

U.S. Cl. 324—61 R **6 Claims**



1. A capacitive extensometer assembly comprising;

a first mounting arm member, and a second mounting arm member;

means for pivotally connecting said first and second mounting arm members together to form an extensometer assembly for permitting relative movement between first ends of the mounting arm members;

means at said first ends of the mounting arm members for engaging a specimen to be tested; and

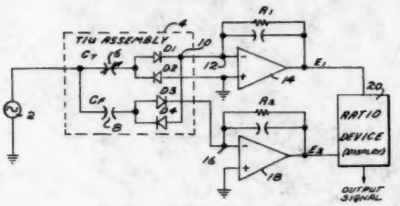
a sensor mounted on the first and second mounting arm members to sense movement between the first and second mounting arm members, said sensor including two portions comprising a proximity detector member having an end surface for sensing proximity to an adjacent surface mounted on the first mounting member, and a target member mounted on the second mounting arm member, said proximity detector and target member having surfaces that face each other and which are spaced apart to form a gap when the first and second mounting arm members are in a reference position and wherein the spacing of the proximity detector and target increases as the first ends of the mounting arm members move apart, the surface of the proximity detector facing the target member surface being formed to be at least partially curved about an axis, which axis is offset from the pivot axis of relative pivotal movement of the first and second arm members so changes in the relative position between the first and second portions of the sensor change as the first mounting arm member and second mounting arm member move.

4,841,227

APPARATUS FOR THE RATIOMETRIC MEASUREMENT OF A QUANTITY OF LIQUID IN A TANK

Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jun. 1, 1987, Ser. No. 55,846
Int. Cl.[4] G01R 27/26; G01F 23/00
U.S. Cl. 324—61 R 20 Claims



1. Apparatus for measuring a quantity of a liquid in a tank, comprising:

first and second capacitive transducer means disposed in a tank and responsive to an AC signal for providing first and second measurement signals, said first measurement signal corresponding to said quantity of liquid in said tank, said second measurement signal corresponding to an empty tank;

first and second rectifier means coupled, respectively, to said first and second transducer means, for respectively receiving said first and second measurement signals and providing first and second current signals;

first current-to-voltage converter means having a first input coupled to said first and second rectifier means, for receiving said first current signal and a portion of said second current signal, and for providing a first voltage signal corresponding to said first and second measurement signals;

second current-to-voltage converter means, coupled to said second rectifier means, for receiving another portion of said second current signal, and for providing a second voltage signal corresponding to said second measurement signal; and

means for forming a ratio of said first and second voltage signals to provide an output signal indicative of said quantity of liquid in said tank.

4,841,228

APPARATUS FOR INDICATING THE RESISTIVE CHARACTERISTIC OF A CAPACITOR

Hitoshi Noguchi, and Hideki Wakamatsu, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 10, 1987, Ser. No. 72,070
Claims priority, application Japan, Jul. 11, 1986, 61-163444
Int. Cl.[4] G01R 27/26
U.S. Cl. 324—62 5 Claims

1. An apparatus for providing an indication of the resistive component of the impedance of a capacitor comprising:

a terminal to which a source of alternating current voltage is to be applied,

means for coupling a capacitor to be tested to said terminal so as to produce a first signal having resistive and capacitive components corresponding to the resistive and capacitive components of current flowing through the capacitor,

means coupled to said terminal for producing a second signal that is out of phase with the capacitive component of said first signal,

a first controllable signal dividing means for supplying at its output a selectable fraction of a signal applied to its input,

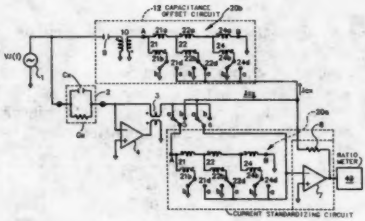
a second controllable signal dividing means for supplying at its output a selectable fraction of a signal applied to its input, said second controllable signal dividing means having its input coupled to receive said second signal,

an operational amplifier having an inverting input, a non inverting input and an output,

means for coupling said non inverting input of said amplifier to a point of reference potential,

a resistor having one end connected to the output of said amplifier and the other end connected to the output of said second signal dividing means,

switching means for coupling said first signal to said inverting input of said amplifier via said first signal dividing means, said output of said second controllable signal dividing means to said first inverting input of said amplifier and the other end said resistor to said inverting input of said amplifier when in a first position and for coupling said first signal to said inverting input of said amplifier, said first signal dividing means between the other end of said resistor and said inverting input of said amplifier and the output of said second signal dividing means to the junction of said resistor and said first signal dividing means when in a second position,



said first and second controllable signal dividing means being controlled so that said first and second signals are withint the same amplitude range, and

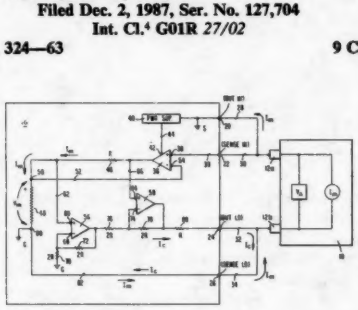
a phase detector coupled to said source of alternating current voltage and the output of said operational amplifier.

4,841,229

METHOD OF AND CIRCUIT FOR OHMMETER CALIBRATION

Larry E. Eccleston, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Dec. 2, 1987, Ser. No. 127,704
Int. Cl.[4] G01R 27/02
U.S. Cl. 324—63 9 Claims



1. For an ohmmeter having an output consisting of first and second terminals, and first and second leads extending from said terminals to be connected to a load, current generator means for causing an ohmmeter current having a predetermined magnitude to flow in said leads and means for measuring

a voltage difference between said leads as a result of said current flowing therethrough to obtain a reading of the electrical resistance of said load:

a calibration circuit for calibrating said ohmmeter, comprising

input terminals to be connected to said first and second leads;

reference resistance means having a known value of resistance;

means for applying said ohmmeter current to said reference resistance means to provide to said ohmmeter a calibration reading corresponding to the resistance of said reference resistance means, wherein a voltage drop within said ohmmeter leads as a result of resistance distributed therein imparts an error to said calibration reading; and

means for compensating said calibration circuit for said voltage drop to eliminate said calibration reading error, comprising circuit means for conducting said current between said ohmmeter terminals and said reference resistance means, and not through said ohmmeter leads, electrically bypassing said ohmmeter leads.

4,841,230

DEVICE FOR MEASURING MOISTURE CONTENT IN GRAINS

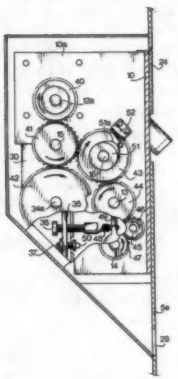
Naoto Sugimoto, Fukuroi, Japan, assignor to Shizuoka Seiki Co., Ltd., Fukuroi, Japan

Filed Sep. 2, 1988, Ser. No. 239,911

Claims priority, application Japan, Sep. 4, 1987, 62-135977[U]

Int. Cl.[4] G01N *27/04*

U.S. Cl. 324—65 R **2 Claims**



1. A device for measuring moisture content in grains, comprising:

a base supporting plate secured to a wall of the device;

a movable supporting plate pivotally mounted on the base supporting plate;

a first roller electrode rotatably mounted on the base supporting plate;

a second roller electrode rotatably mounted on the movable supporting plate adjacent the first roller electrode;

a spring provided between the base and movable supporting plates so as to press the second roller electrode against the first roller electrode;

a motor mounted on the base supporting plate;

a gear train operatively connected between the motor and the first and second electrodes, for driving the electrodes.

4,841,231

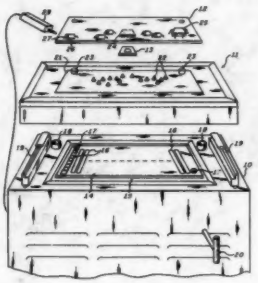
TEST PROBE ACCESSIBILITY METHOD AND TOOL

Ernest A. Angelucci, Kennett Square, Pa., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 30, 1987, Ser. No. 114,918

Int. Cl.[4] G01R *1/04, 31/02*

U.S. Cl. 324—73 R **7 Claims**



1. A method for verifying continuity between the pins of a potentially faulty component on a circuit card and the associated probes of an automatic test system where said pins are not accessible from the component side of the card and said probes are electrically isolated with respect to each other, each said probe providing a distinct electrical path to said automatic test system, comprising the steps of:

shorting said pins of said component with respect to each other by shorting means,

probing a point of said card on said component side thereof with a continuity probe of said system, where said point is in electrical contact through other than said shorting means with at least one of said pins of said component, and

performing a separate respective continuity test with respect to each of said associated probes using said continuity probe and said automatic test system, said continuity probe being in contact with said point for each said test.

4,841,232

METHOD AND APPARATUS FOR TESTING THREE STATE DRIVERS

Patricia K. Graham, and Robert R. Williams, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,703

Int. Cl.[4] G01R *31/28*

U.S. Cl. 324—73 R **28 Claims**

1. In a circuit having a data bus, the improvement comprising,

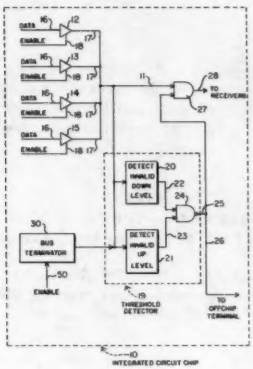
data driver means having a data input, a data output and an enable input,

means connecting the data output of said data driver means to said data bus, to thereby drive said data bus with a binary signal when said data driver means is enabled, or to present a high impedance to said data bus when said data driver means is disabled,

receiver means connected to said data bus, and

test means connected to said data bus operable to provide an output signal of one state that is indicative of a valid

binary signal on said bus when said data driver means is enabled, and an output signal of an opposite state that is



indicative of an invalid binary signal on said bus when said data driver means is disabled.

4,841,233

SEMICONDUCTOR INTEGRATED CIRCUIT ADAPTED TO CARRY OUT OPERATION TEST

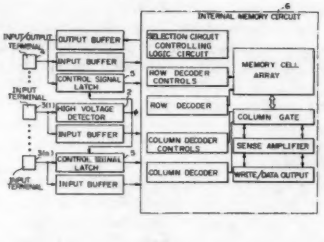
Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 876,456, Jun. 20, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 175,667

Claims priority, application Japan, Jun. 20, 1985, 60-134649

Int. Cl.[4] G01R *31/00;* **G11C** *7/00, 29/00*

U.S. Cl. 324—73 R **6 Claims**



1. A semiconductor integrated circuit device adapted to carry out a test operation, comprising:

an internal memory circuit operating under one of a normal mode and test mode, including:

a memory cell array;

a row decoder circuit coupled to said memory cell array;

a column gate circuit coupled to said memory cell array; and

a column decoder circuit coupled to said column gate circuit;

a plurality of input and output terminals connected to said internal memory circuit;

a high voltage detector circuit, connected to one of said input and output terminals, for outputting a control signal only when a predetermined voltage higher than a power source voltage is applied to one of said input and output terminals;

latch means, connected to said row and column decoders, to said internal memory circuit and to one of said input and output terminals not connected to said high voltage detector circuit, for latching an input signal in response to said control signal from said high voltage detector circuit;

buffer means, connected to said latch means and said internal memory circuit, for receiving input and output signals; and

selection means, coupled to said buffer means, for selecting one of the normal mode and test mode of said internal memory circuit in accordance with the input signal latched by said latch means.

4,841,234

VOLTAGE DETECTOR UTILIZING AN OPTICAL PROBE OF ELECTRO-OPTIC MATERIAL

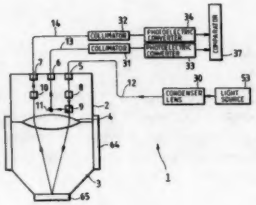
Shinichiro Aoshima, and Yutaka Tsuchiya, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 31, 1988, Ser. No. 200,563

Claims priority, application Japan, May 31, 1987, 62-137056

Int. Cl.[4] G01R *19/00, 31/00;* **G02F** *1/09*

U.S. Cl. 324—96 **12 Claims**



1. A voltage detector for detecting a voltage developing in a selected area of an object to be measured, comprising:

a light source for emitting a light beam;

a voltage-sensing part including first reflection means for reflecting an input light beam, and an electro-optic material whose refractive index changes according to said voltage developing in said selected area of said object;

splitting and extracting means for extracting a light beam with a first predetermined polarized component from a light beam introduced from said light source which is launched into said electro-optic material as said input light beam, and extracting an output light beam with a second predetermined polarized component from an output light beam emerging from said electro-optic material after reflecting from said first reflection means;

an optical means disposed between said voltage sensing part and said splitting and extracting means, for making light paths of said input light and said output light different from each other; and

detection means for determining said voltage developing in said selected area of said object on the basis of intensity of said output light beam with said second predetermined polarized component.

4,841,235

MRS CURRENT SENSOR

Jerome K. Hastings, Sussex; Bruce C. Beihoff, Glendale; Michael S. Baran, Wauwatosa; Mark A. Juds, New Berlin, and James E. Hansen, Oka Creek, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 11, 1987, Ser. No. 61,351

Int. Cl.[4] G01R *19/00, 33/02*

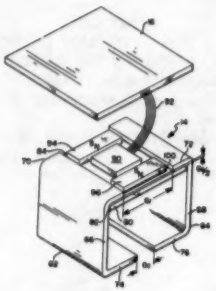
U.S. Cl. 324—117 R **28 Claims**

1. A current sensor for measuring current flow in an electrical conductor, said sensor comprising:

a magnetic flux concentrator comprising a magnetic pole structure substantially encircling the cross-sectional shape of said conductor and including two magnetic pole por-

tions spaced to provide a magnetic sensing region therebetween whereby electrical current flowing in said conductor will induce a magnetic field within said region;

means disposed to measure a component of magnetic field intensity along a principal axis within said sensing region and operative to generate an output signal as a function thereof; and



means operative to generate a component of magnetic field intensity within said region along an axis offset from said principal axis, said offset component having a characteristic magnitude substantially unaffected by flow of current in said conductor.

4,841,236

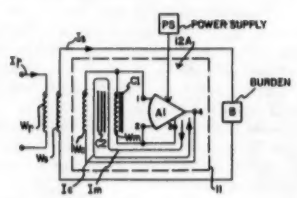
CURRENT RATIO DEVICE

Petar N. Miljanic, Gloucester, and William J. M. Moore, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne Des Brevets Et D'Exploitation Limitee, Ottawa, Canada

Filed Mar. 22, 1988, Ser. No. 171,765

Int. Cl.[4] G01R *1/20*

U.S. Cl. 324—127 **21 Claims**



1. A device for use in constructing an alternating current, current transformer, said device comprising

(a) a first magnetic core,

(b) a second magnetic core,

(c) a measuring winding having Nm turns electromagnetically coupled with the first core but not with the second core,

(d) a compensating winding having Nc turns electromagnetically coupled with both cores,

(e) an amplifier having an input and an output,

(f) said input being connected to receive the waveform across the measuring winding,

(g) said output being connected to the compensating winding to provide a compensating currect Ic through the conpensating winding equal to a magnetizing current Iμ required to magnetize the second core, and

(h) said output being connected to the measuring winding to provide a measuring current Im through the measuring winding in a direction opposite to that of the compensating current and equal to

$$\frac{IcNc}{Nm},$$

whereby, when primary and secondary windings are electromagnetically coupled with the cores to form an alternating current, current transformer and the secondary winding is connected to a burden, the magnetizing current Iμ for such transformer is provided by the device.

4,841,237

CURRENT-MEASURING DEVICE

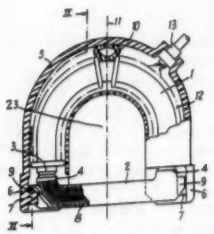
Bernard Landre, Paris, France, assignor to Universal Technic, Paris, France

Filed Aug. 7, 1987, Ser. No. 82,543

Claims priority, application France, Aug. 11, 1986, 86 11586

Int. Cl.[4] G01R *19/00, 1/04*

U.S. Cl. 324—127 **4 Claims**



1. A current-measuring device comprising an annular magnetic circuit having separate first and second magnetic circuit portions with ends suitable for coming face-to-face to form a closed magnetic circuit, a housing surrounding at least the first portion of the magnetic circuit, magnetic flux detection means for detecting a magnetic flux in the magnetic circuit, and locking means for locking the two magnetic circuit portions against each other, wherein said locking means include fastening portions of the housing extending beyond the ends of the first magnetic circuit portion on respective outer sides thereof, and wherein said second magnetic circuit portion is mounted to pivot about pivot means relative to the fastening portions between a first position in which the ends of the second magnetic circuit portion are not face-to-face with the ends of the first magnetic circuit portion and where the second magnetic circuit portion is laterally displaceable for the purpose of disengaging from the pivot means, and a second position where the second magnetic circuit portion has its ends pressed against the ends of the first magnetic circuit portion and where the second magnetic circuit portion is immobilized, the device further including means to enable the ends of the first magnetic circuit portion to move relative to the pivot means.

4,841,238

GAUGE DRIVING SYSTEM

Barry Birch, Abbeyfeale, Ireland, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Dec. 15, 1987, Ser. No. 133,078

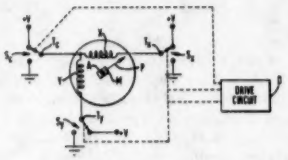
Claims priority, application United Kingdom, Dec. 17, 1986, 8630086

Int. Cl.[4] G01R *1/20*

U.S. Cl. 324—144 **11 Claims**

1. In an air-core gauge comprising first and second magnetic field-generating coils each with first and second ends, a first connection point connected to the first end of the first coil and to the first end of the second coil, second and third connection

points at the second ends of the respective coils, and a rotatably-mounted pointer means within the magnetic fields generated by the two coils having a reference position: a driving system comprising means providing two signal levels, switching means for selectively connecting each of said connection points to either of said two signal levels, and driving means for controlling said switching means so that one of said connection



points is connected alternately to said two signal levels with variable duty cycle to turn said pointer means through a corresponding angle from said reference position, wherein said switching means and driving means serve, for any given angle of said pointer means relative to said reference position, to connect only one of said connection points alternately to said two signal levels whilst at the same time maintaining each of the other connection points at either of the two signal levels.

4,841,239

METHOD AND MEASURING INSTRUMENT FOR IDENTIFYING THE DIFFUSION LENGTH OF THE MINORITY CHARGE CARRIERS FOR NON-DESTRUCTIVE DETECTION OF FLAWS AND IMPURITIES IN SEMICONDUCTOR CRYSTAL BODIES

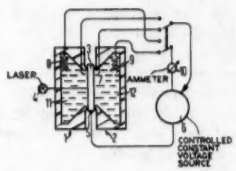
Helmut Foell, and Volker Lehmann, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 197,603

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1987, 3719921

Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—158 R **12 Claims**



1. A method for identifying the diffusion length (L) of minority charge carriers and their topical fluctuations and for non-destructive detection of flaws and impurities in a semiconductor crystal body, comprising the steps of:

(a) placing the semiconductor crystal body between two electrolyte-filled measuring chamber halves so that a front side and a backside of the semiconductor crystal body are each in contact with electrolyte contained in both measuring chamber halves;

(b) connecting the semiconductor crystal body to a voltage source via an ohmic contact and applying a voltage between the backside of the semiconductor crystal body and an electrode of the measuring chamber half connected to the backside of the semiconductor crystal body so that a blocking space charge zone is formed at the backside of the semiconductor crystal body;

(c) irridating with light the front side of the semiconductor crystal body;

(d) measuring the photocurrent I_G of the minority charge carriers occurring at the backside during the irradiation,

(e) applying a voltage between the front side of the semiconductor crystal body and an electrode of the measuring chamber half connected to the front side of the semiconductor crystal body so that a blocking space charge zone is formed at the front side of the semiconductor crystal body;

(f) measuring the photocurrent I_0 of substantially generated minority charge carriers occurring at the front side of the semiconductor crystal body upon irradiation;

(g) calculating the diffusion length (L) from the mathematical equation:

$$I_G/I_0 = \frac{\alpha^2 \cdot L^2}{1 - \alpha^2 L^2} \cdot \frac{-2}{\exp(-D/L) + \exp(+D/L)}$$

where α is the absorption coefficient and D is the specimen thickness.

4,841,240

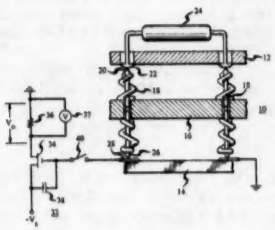
METHOD AND APPARATUS FOR VERIFYING THE CONTINUITY BETWEEN A CIRCUIT BOARD AND A TEST FIXTURE

Ching-Wen Hsue, and Wha-Joon Lee, both of Lawrenceville, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 29, 1988, Ser. No. 149,829

Int. Cl.[4] G01R *1/04, 31/02*

U.S. Cl. 324—158 P **8 Claims**



5. A circuit for indicating whether each of a pair of conductive members is in electrical contact with each of a pair of interconnected nodes on a body, even when the nodes are connected by a high-impedance circuit path, characterized in that said circuit comprises:

a field effect transistor having a drain, gate and source;

a capacitor coupled between the gate and source of the field effect transistor;

means for selectively coupling the gate of the FET to one of the pair of conductive members while the other of the pair of members is coupled to a first potential; and

a resistor coupled in series with the drain-to-source portion of the field effect transistor between circuit ground and a voltage source of a potential less than said first potential, the resistor carrying a voltage thereacross whose magnitude changes when the FET becomes conductive which occurs when each of the conductive members is in contact with a separate one of the interconnected nodes, notwithstanding the impedance of the circuit path connecting the nodes.

4,841,241

TESTING DEVICE FOR BOTH-SIDED CONTACTING OF COMPONENT-EQUIPPED PRINTED CIRCUIT BOARDS

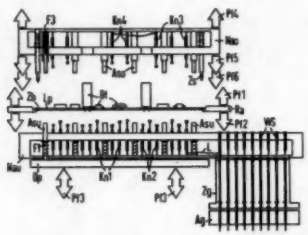
Wolfgang Hilz, Munich; Rudolf Schuster, Helmstetten, and Hans Schauflinger, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 21, 1987, Ser. No. 75,994

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626693

Int. Cl.[4] G01R *1/04, 1/073*

U.S. Cl. 324—158 F 20 Claims



17. A testing device for component equipped printed circuit boards having an underside and an upperside, comprising:

a stationary lower needle adapter carrying a plurality of lower pressure rams and carrying resilient lower contact needles arranged test-specimen-associated for contacting the underside of the printed circuit board;

a plurality of resilient upper pressure rams arranged test-specimen-associated for engaging the upperside of the printed circuit boards;

a vertically adjustable, relative to said lower needle adapter, upper needle adapter carrying said upper pressure rams, and carrying resilient upper contact needles arranged test-specimen-associated for contacting the upperside of the printed circuit board; and

said plurality of non-resilient lower pressure rams arranged test-specimen-associated for engaging the underside of the printed circuit board.

4,841,242

METHOD FOR TESTING CONDUCTOR NETWORKS

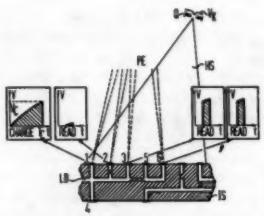
Matthias Brunner, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,758

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712176

Int. Cl.[4] G01R *31/00, 31/02*

U.S. Cl. 324—158 R 8 Claims



1. A method for testing conductor networks comprising the steps of, changing the charge condition of a first point (1) of the conductor network by irridating with a first particle beam (PE), irridating with the first or a second particle beam (PE) a second point (2) of the conductor network, detecting the charge condition of the second point (2) by detecting the secondary particles triggered at said second point, and irridating said first and second points (1, 2) of the conductor network with a third particle beam (HS) which has a particle energy (E_{HS}) so as to compensate for losses occurring in the conductor network.

4,841,243

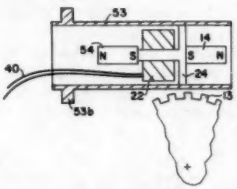
SIDE-LOOKING SPEED SENSOR

Eugene R. Bishop, Fort Lauderdale; Matthew L. Schneider, Margate, both of Fla., and Hermann Rosshirt, Bristol, Conn., assignors to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 718,307, Apr. 1, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 882,801

Int. Cl.[4] G01P *3/48;* H02K *17/42*

U.S. Cl. 324—174 18 Claims



12. An arrangement for detecting the speed of a gear or the like, said arrangement comprising

a gear or the like having a plurality of magnetizable elements about the circumference thereof, said gear having an axis of rotation located centrally of said elements,

a speed sensor comprising an elongated pole piece of soft magnetic material defining an axis therethrough between opposed ends thereof, a coil surrounding said elongated pole piece substantially coaxially therewith, a disc-like pole piece extending radially from said elongated pole piece coaxially therewith and having a larger diameter than said coil, and an axially magnetized permanent magnet substantially coaxial with and abutting one of said pole pieces, said device being oriented adjacent the periphery of said gear and transversely thereof so that said disc-like pole piece is proximate to the periphery of said gear and said elements move substantially perpendicular to the plane of said disc-like pole piece when said gear and said disc-like pole piece are most proximate, a tubular housing of non-magnetic material and sized to closely receive said disc-like pole piece therein, said housing receiving said pole pieces coaxially therein.

4,841,244

METHOD AND APPARATUS FOR ON-SINE MONITORING OF WEAR IN MACHINERY

Keith W. Chambers, Pinawa, Canada, assignor to Her Majesty the Queen in Right of Canada as Represented by the Minister of National Defence, Canada

Filed Sep. 18, 1986, Ser. No. 908,731

Claims priority, application Canada, Oct. 11, 1985, 492,775

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] G01N *27/74;* G01R *33/12;* G01F *1/708;* G01P *5/18*

U.S. Cl. 324—204 32 Claims

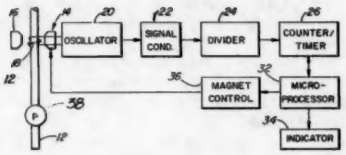
1. A device for producing an electrical signal which is proportional to the concentration of ferromagnetic particulate material in a fluid stream, said device comprising, in combination:

a sensing coil arranged to form the inductance voil of and

connected to a radio frequency oscillator arranged to produce an electrical signal at a base frequency;

magnetic trap means for producing a magnetic field; and

support means for supporting said sensing coil and said magnetic trap means in juxtaposition to one another such that, when said coil is disposed within or proximate said



fluid stream and electricaly connected said radio frequency oscillator, energization of said magnetic trap means causes ferromagnetic particulate material proximate said coil to be attracted toward said coil resulting in a deviation of the frequency of said signal from said base frequency proportional to the concentration of ferromagnetic particulate material in said fluid stream.

4,841,245

DISPLACEMENT SENSOR HAVING MULTIPLEXED DUAL TANK CIRCUITS

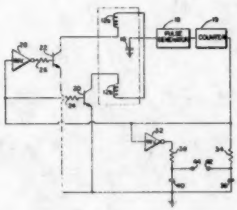
David Fiori, Jr., Yardley, Pa., assignor to Sensor Technologies, Inc., Pennsauken, N.J.

Continuation of Ser. No. 821,982, Jan. 29, 1986, which is a continuation-in-part of Ser. No. 700,081, Feb. 11, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 8,639

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] G01B *7/14*

U.S. Cl. 324—208 **11 Claims**



1. Sensor apparatus comprising:

a sensor having first and second tank circuits and a movable metal member;

means for moving said movable metal member, relative to a portion of each of said first and second tank circuits, in accordance with changes in a parameter being monitored, to change the relative resonant frequencies of said first and second tank circuits; and

circuit means, responsive to changes in the relative resonant frequencies of said first and second tank circuits, for developing indications of changes in said parameter being monitored, said circuit means including;

(a) a pulse generator for producing a first series of pulses having a repetition rate related to the resonant frequency of said first tank circuit and a second series of pulses having a repetition rate related to the resonant frequency of said second tank circuit;

(b) a counter, responsive to said first and said second series of pulses, for counting a prescribed number of pulses of said first series and a prescribed number of pulses of said second series and for developing a first counter output pulse having a duration related to the time required to count said first series prescribed number of pulses and a second counter output pulse having a duration related to the time required to count said second series prescribed number of pulses;

(c) tank circuit switching means, responsive to said counter output pulses, for connecting said first tank circuit to said pulse generator for the duration of said first counter output pulse and for connecting said second tank circuit to said pulse generator for the duration of said second counter output pulse; and

(d) means, responsive to said counter output pulses, for developing an output indication of the relative time durations required for counting said prescribed number of pulses of said first series of pulses and said prescribed number of pulses of said second series of pulses.

4,841,246

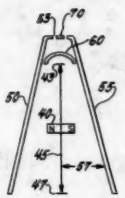
MULTITURN SHAFT POSITION SENSOR HAVING MAGNET MOVABLE WITH NONROTATING LINEAR MOVING NUT

Mark A. Juds, New Berlin, and Bruce C. Beihoff, Glendale, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1987, Ser. No. 139,218

Int. Cl.[4] G01B *7/30*

U.S. Cl. 324—208 **15 Claims**



1. A multiturn shaft position sensor for detecting the position of a multiturn shaft comprising:

a multiturn screw disposed to turn with the multiturn shaft;

a nonrotating nut mounted on said multiturn screw for linear movement dependent upon the turning of said multiturn screw;

a magnet disposed upon said nonrotating nut for linear movement along a predetermined movement path from a first end to a second end with said linear movement of said nonrotating nut;

a pair of flux plates formed of a material of high magnetic permeability disposed on opposite sides of said movement path of said magnet having a narrow gap therebetween proximate to said first end of said movement path;

a magneto resistive structure disposed in said narrow gap between said pair of flux plates having an electrical resistance dependent upon the magnetic flux therethrough; and

an electrical circuit connected to said magneto resistive structure for measuring said electrical resistance of said magneto resistive structure and generating a position signal indicative of the position of the multiturn shaft proportional to said electrical resistance of said magneto resistive structure.

4,841,247

METHOD FOR INTERPOLATIVE EXTENSION OF NUCLEAR MAGNETIC RESONANCE IMAGE

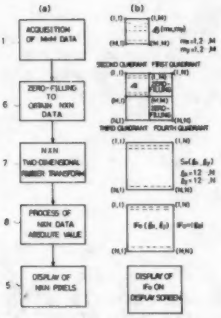
Hidenobu Itagaki, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 912,750, Sep. 26, 1986. This application May 31, 1988, Ser. No. 203,552

Claims priority, application Japan, Oct. 15, 1985, 60-229051

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 11 Claims



1. A method for extending a two-dimensional nuclear magnetic image array filled with sampling data obtained by the step of two-dimensionally sampling a nuclear magnetic resonance signal representative of a predetermined characteristic of specific atomic nuclei in a test piece, comprising the steps of: creating a two-dimensional extension array which is larger than said image array and which has a portion equal in size to and containing said sampling data from said image array; zero filling all of said extension array other than said portion thereof; and thereafter two-dimensionally Fourier-transforming said extension array.

4,841,248

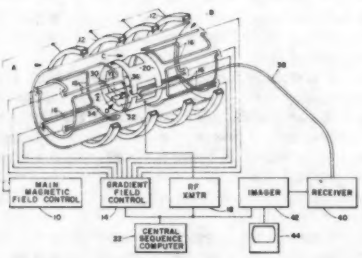
TRANSVERSE FIELD LIMITED LOCALIZED COIL FOR MAGNETIC RESONANCE IMAGING

Mehrdad Mehdizadeh, University Hts.; John L. Patrick, Solon, and George J. Misic, Novelty, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 931,726, Nov. 17, 1986, Pat. No. 4,753,738, which is a continuation-in-part of Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Aug. 17, 1987, Ser. No. 86,277

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 20 Claims



1. A magnetic resonance apparatus comprising:

a main magnetic field generating means for generating a main magnetic field along a main field axis through an examination region;

a magnetic resonance excitation means for exciting magnetic resonance of nuclei of a subject in the examination region;

a localized coil assembly for receiving radio frequency signals from the resonating nuclei, the coil assembly including:

an inner conductor defining a first current path along the main field axis and closely adjacent a surface of the subject,

an outer conductor defining a current path along the main magnetic field axis, generally parallel to a surface of the subject and displaced further from the subject than the inner conductor,

a connecting means for electrically connecting adjacent first ends of the inner and outer conductors; and,

a coupling means connected adjacent second ends of the inner and outer conductors for interconnecting the conductors with a cable extending to a receiver.

4,841,249

TRUNCATED CONE SHAPED SURFACE RESONATOR FOR NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY

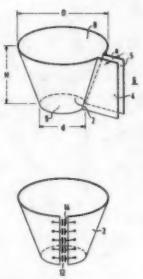
Wilhelm Duerr, Erlangen; Hartwig Ingwersen, Uttenreuth; Norbert Krause, Heroldsbach, and Ralph Oppelt, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 6, 1987, Ser. No. 105,003

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636660

Int. Cl.[4] H01P *7/00*

U.S. Cl. 324—318 3 Claims



3. A surface resonator for nuclear magnetic resonance tomography comprising:

a ribbon-shaped electrical conductor having upper and lower edges arranged in a loop having spaced ends forming a gap in said loop, said conductor having a shape conforming substantially to the surface of a truncated cone with said upper edge of said conductor surrounding a first area and said lower edge of said conductor surrounding a second area different in size from said first area to permit differently sized areas of a patient to be examined using said surface resonator; and

capacitive means electrically connected to said spaced ends of said conductor and having a capacitance for defining the resonant frequency of said resonator.

4,841,250

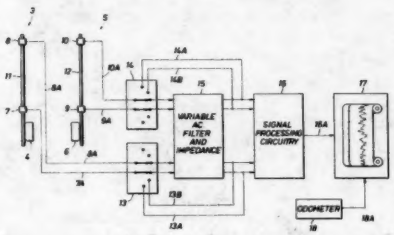
PASSIVE GEOPHYSICAL SURVEY APPARATUS BASED UPON THE DETECTION OF THE DC COMPONENT OF THE VERTICAL ELECTRICAL POTENTIAL OF NATURAL EARTH CURRENTS

John R. Jackson, Englewood, Colo., assignor to J. R. Jackson and A. M. (Andy) Arismendi, Jr., Gaithersburg, Md.

Filed Jan. 24, 1986, Ser. No. 821,967

Int. Cl.[4] G01V *3/165, 3/08*

U.S. Cl. 324—349 **3 Claims**



1. An apparatus for performing passive geophysical measurements as a function of the natural Earth currents, said apparatus comprising:

(a) at least one pair of vertically spaced non-polarized electrodes wherein each of said at least one pair of electrodes consist essentially of

(1) a lower non-polarized electrode spaced above the Earth and within the lower atmosphere adjacent thereto and

(2) an upper non-polarized electrode arranged within said lower atmosphere and vertically positioned above said lower electrode,

(b) circuit means electrically connected to said at least one pair of electrodes for sensing an electrical potential occurring between each pair of said at least one pair of electrodes as a function of said natural Earth currents adjacent said at least one pair of electrodes and for generating an electrical signal proportional thereto, and

(c) AC filtering means electrically connected to said circuit means for receiving said electrical signal, said AC filtering means filtering out the AC component of said electrical signal leaving the DC component thereof and out-putting a DC signal, and

(d) measuring means electrically connected to said AC filtering means for receiving, measuring and indicating said DC signal, said DC signal providing an indication of the lithological character of adjacent Earth materials as a function of the DC component of said electrical potential.

4,841,251

METHOD OF GENERATING A VOLTAGE WITH A TRIANGULAR SHAPE FROM A SAWTOOTH WAVEFORM

Uwe Hartmann, and Fritz Ohnemus, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany

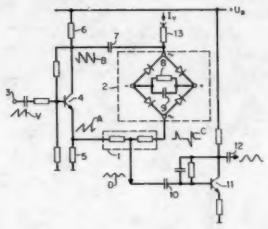
Filed Jan. 7, 1988, Ser. No. 142,560

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701927

Int. Cl.[4] H03K *5/08, 4/10*

U.S. Cl. 328—36 **11 Claims**

1. A method for generating a voltage waveform having a triangular shape, comprising the steps: supplying a first voltage waveform having a sawtooth shape; supplying a second voltage waveform having a sawtooth shape opposite in phase to the sawtooth shape of said first voltage waveform, forming horizontal components on said second voltage waveform during predetermined intervals of said second voltage waveform, said first voltage waveform and said second voltage waveform having equal peaks; and adding said first voltage waveform to said second voltage waveform with said horizontal components thereon for generating said voltage waveform with triangular shape.



4,841,252

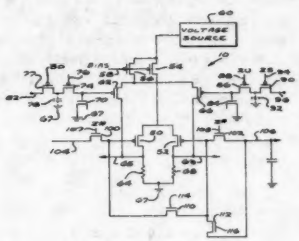
SYSTEM FOR COMPENSATING FOR OFFSET VOLTAGES IN COMPARATORS

Perry W. Lou, Carlsbad, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Aug. 5, 1987, Ser. No. 81,910

Int. Cl.[4] H03F *1/02*

U.S. Cl. 330—9 **30 Claims**



1. In combination for providing a correction in a comparator to compensate for an offset voltage produced in the comparator,

an amplifier having a first input for a reference voltage and a second input for a variable voltage and having an output and having characteristics to produce the offset voltage,

means for introducing the reference voltage to the first input,

means for introducing the variable voltage to the second input to obtain the production in the amplifier of the offset voltage and a voltage representative of the difference between the variable and reference voltages,

means for periodically shorting the first and second inputs to provide for the introduction of the reference voltage to both inputs,

means for determining the offset voltage from the amplifier when the first and second inputs are shorted, and

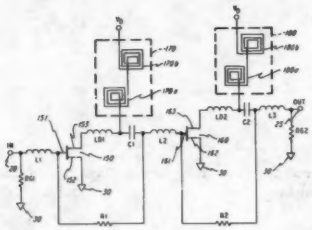
means for introducing the offset voltage to the output of the amplifier when the reference voltage is introduced to the first input and the variable voltage is introduced to the second input, the offset voltage being introduced to the output of the amplifier in a polarity for compensating for the offset voltage produced in the comparator.

4,841,253

MULTIPLE SPIRAL INDUCTORS FOR DC BIASING OF AN AMPLIFIER

Carl A. Crabill, Richardson, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 15, 1987, Ser. No. 38,377
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—277 **6 Claims**



1. An amplifying means having an input circuit adapted for receiving electromagnetic wave signals and an output circuit, said amplifying means comprising:

a plurality of amplifying stages cascadingly connected between said input circuit and output circuit of said amplifying means wherein said plurality of amplifying stages provides a signal path between said input circuit and output circuit, wherein each of said amplifying stages includes an input portion and an output portion; and

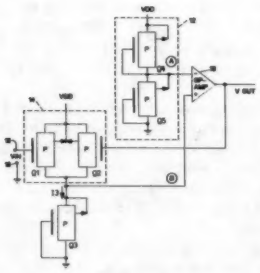
inductive means connected outside said signal path and between each output portion of said amplifying stages and a DC bias, said inductive means including at least two spiral inductors connected in series, wherein each of said spiral inductors includes a predetermined inductance for providing a cumulative impedance between the respective output portions of said amplifying stages and said DC bias for isolating said electromagnetic wave signals from said DC bias in a frequency band of 1.5 GHz and 3.0 GHz.

4,841,254

CMOS PRECISION GAIN AMPLIFIER

Eugene R. Bukowski, Cary, and Charles R. Hoffman, Raleigh, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 29, 1987, Ser. No. 55,651
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **15 Claims**



1. An improved amplifier circuit arrangement for integrating with other components on a semiconductor chip said amplifier circuit arrangement comprising:

a power supply having a single voltage supply rail;

an amplifier circuit means having an inverting input terminal, a non-inverting input terminal and an output terminal;

a voltage divider network for generating a reference biasing voltage coupled to the inverting input;

a gain settng network including only active circuit devices for setting the gain of said amplifier; said gain setting network having a first node coupled to the single voltage supply rail, a second node coupled to the non-inverting input terminal, a first control terminal coupled to an input signal source and a second control terminal coupled to the output terminal; and

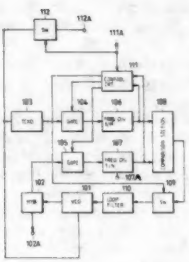
a first FET device having a source and a substrate terminal coupled to the second node and a control terminal and drain terminal coupled to a reference potential.

4,841,255

FREQUENCY SYNTHESIZER

Motoi Ohba, and Mitsuo Makimoto, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 23, 1988, Ser. No. 210,456
Claims priority, application Japan, Jun. 24, 1987, 62-156814
Int. Cl.[4] H03L *7/18*
U.S. Cl. 331—14 **10 Claims**



1. A frequency synthesizer comprising:

(a) a first oscillator outputting a signal having a reference frequency;

(b) a first frequency divider dividing the frequency of the output signal from the first oscillator;

(c) a second oscillator outputting a signal having a target frequency;

(d) a second frequency divider dividing the frequency of the output signal from the second oscillator;

(e) a phase comparator comparing phases of output signals from the first and second frequency dividers;

(f) an integrator integrating an output signal from the phase comparator and controlling the second oscillator in accordance with the integration of the output signal from the phase comparator;

(g) a first gate connected between the first oscillator and the first frequency divider;

(h) a second gate connected between the second oscillator and the second frequency divider;

(i) a third gate connected between the phase comparator and the integrator; and

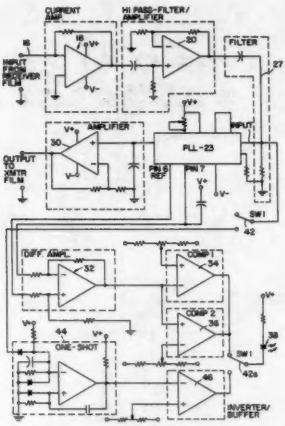
(j) means for controlling the first gate, the second gate, and the third gate in accordance with the output signals from the first and second frequency dividers and with an external synthesizer control signal.

4,841,256

PIEZOELECTRIC PHASE LOCKED LOOP CIRCUIT

Raymond F. Gastgeb, Doylestown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 20, 1987, Ser. No. 110,260
Int. Cl.[4] G01F *23/22*; G01L *1/16*; H03L *7/08*
U.S. Cl. 331—25 **8 Claims**



1. A piezoelectric phase-lock loop circuit comprising:

(a) a structural member having a piezoelectric transmitter film and a piezoelectric receiver film adhered thereto, said transmitter film producing electro-mechanical vibrations in said structural member upon activation by an alternating current input signal, said receiver film producing alternating output signals in response to vibration of said structural member;

(b) voltage controlled oscillator means for generating said alternating input signal;

(c) phase comparator means for comparing the phase angle of the signal produced by said receiver film with the phase angle of said alternating input signal and for outputting a signal corresponding to the differential in phase angle;

(d) low pass filter means connected to the output of said phase comparator means for inputting a dc error signal corresponding to said phase differential to said voltage controlled oscillator means, said dc error signal forcing the frequency of said voltage controlled oscillator means to track said output signal whereby a predetermined phase relationship is maintained between said output and input signals.

4,841,257

HIGH-SPEED SAMPLING PHASE DETECTOR FOR CLOCK AND DATA RECOVERY SYSTEM

Larry R. Morrison, and Vaughn J. Jenkins, both of Bountiful, Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 28, 1988, Ser. No. 173,799
Int. Cl.[4] H03D *13/00*; H03L *7/08*
U.S. Cl. 331—26 **13 Claims**

1. A high-speed sampling phase detector for clock and data recovery systems, comprising:

differentiating means for receiving coded input data signals and for generating sampling pulses,

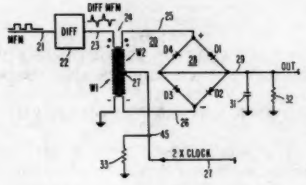
high-speed transformer means having a primary winding coupled to the sampling pulse output of said differentiating means,

high-speed fullwave diode bridge rectifying means,

a secondary winding of said transformer means being coupled to the input of said diode bridge rectifying means,

clock means having clock signals whose rates is at twice the data rate,

said clock means being connected as an input to a center tap of said secondary winding of said transformer means,



error signal means coupled to the output of said bridge rectifying means,

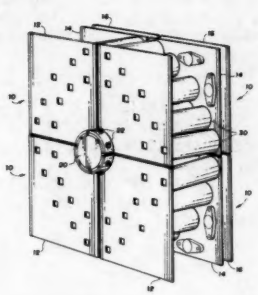
said sampling pulses being employed to sample portions of said clock signals to provide a D.C. error signal at the output of said bridge rectifying means.

4,841,258

METHOD FOR PACKAGING A MICROWAVE TUBE MODULATOR

Dan Ehrenhalt, Buffalo, and George R. Giles, Getzville, both of N.Y., assignors to LTV Aerospace & Defense Co., Dallas, Tex.

Filed Feb. 16, 1988, Ser. No. 156,175
Int. Cl.[4] H03K *7/00*
U.S. Cl. 332—9 R **38 Claims**



1. A method for packaging into an effective module components, particularly power transistors, in the primary circuit of a microwave tube modulator output transformer to minimize electrical resistance and inductance in the primary circuit, the process comprising the steps of:

connecting a first plate to a first end of the microwave tube modulator output transformer primary, and connecting said first plate to a source of positive voltage;

mounting a second plate in spaced apposition to said first plate, and connecting said second plate to ground;

mounting a third plate in progressively spaced apposition to said first plate and said second plate, and connecting said third plate to a second end of the output transformer primary; and

mounting a plurality of primary circuit power transistors on said third plate at minimum practical distances from the second end of the output transformer primary such that the common element of each of said power transistors is connected to said third plate and therefore effectively connected to the second end of the output transformer primary, said first plate providing a low-resistance path for current flowing between the output transformer primary and the source of positive voltage and said third

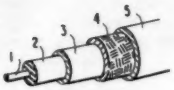
plate providing a low-resistance path for current flowing between the respective drain elements of said power transistors and the output transformer primary, said first and said third plates also minimizing inductance in the output transformer primary circuit.

4,841,259

WAVE PROPAGATION STRUCTURES FOR ELIMINATING VOLTAGE SURGES AND ABSORBING TRANSIENTS

Ferdy Mayer, 92-98 boulevard Victor-Hugo, 92115 Clichy, France

Filed Sep. 16, 1987, Ser. No. 97,014
Claims priority, application France, Sep. 13, 1986, 86 13093
Int. Cl.[4] H01P *1/22, 3/06, 3/08*
U.S. Cl. 333—17.2 **22 Claims**



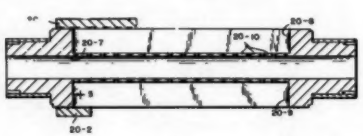
1. Structure adapted to propagate an electromagnetic wave, comprising: at least one conductive member, and an adjacent dielectric material distributed in a wave propagation direction, through which said wave passes, said dielectric material exhibiting non-linear conductivity such that it is substantially non-conductive at a rated applied voltage of the structure, and substantially conductive at any abnormally high applied voltage, said distributed dielectric material comprising a granular, conductive polycrystaline material having thin interstitial, substantially insulating layers disposed between grains of said polycrystaline material.

4,841,260

HALF WAVE PLATE

William F. Call, Bellingham, Mass., assignor to Epsco, Incorporated, Hopkinton, Mass.

Filed Jan. 14, 1987, Ser. No. 3,207
Int. Cl.[4] H01P *1/165*
U.S. Cl. 333—21 A **2 Claims**



1. A microwve device comprising a member defining an axial circular waveguide wall, said member also defining a pair of cavities positioned on opposite longitudinal sides of said waveguide wall a plurality of slots in the wall between said circular waveguide and each of said cavities, said cavities having two side broad walls, two narrow end walls and a top wall opposite said slots in width than the width of said side walls, and means for supporting said member for rotation.

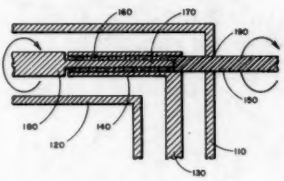
4,841,261

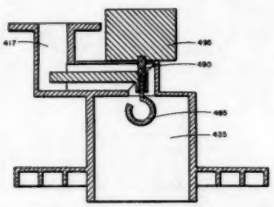
MICROWAVE ROTARY JUNCTION WITH EXTERNAL ROTARY ENERGY COUPLING

Eugene P. Augustin, 2713 Lemon Tree La., Orlando, Fla. 03209

Filed Sep. 1, 1987, Ser. No. 91,710
Int. Cl.[4] H01P *1/06*
U.S. Cl. 333—21 A **8 Claims**

1. A microwave rotary junction with mechanical energy coupling means comprised of a first, stationary, TEM type transmission line and a second TEM type transmission line having a rotatable center conductor, said rotatable center conductor having a first end and a second end and said rotatable center conductor being choke coupled to a stationary conductor of said first TEM transmission line so that said first end extends beyond said stationary conductor of said first transmission line and said second end is an open circuit on said second coaxial TEM line and wherein said rotatable center





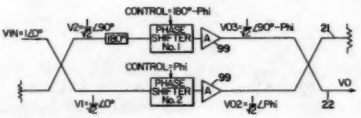
conductor is connected by a dielectric rod extending from said second end of said rotatable center conductor to the outside of said first transmission line to form a drive for performing at least one of the following energy coupling means: a- driving said rotatable transmission line conductor by external means; and b- driving an external device by said rotatable transmission line conductor.

4,841,262

RADIO FREQUENCY POWER MODIFICATION WITHOUT PHASE SHIFT

Michael Lomangino, Dix Hills, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 24, 1986, Ser. No. 888,676
Int. Cl.[4] H01P *1/22, 5/12*
U.S. Cl. 333—81 R **2 Claims**



1. A microwave circuit for controlling the level of radio frequency power without a phase shift comprising:

input and output hybrid elements for coupling power into and out of said circuit and into and out of first and second channels for conduction equal amounts of power between said input and output hybrid elements;

first and second adjustable phase shift element, in corresponding ones of said first and second channels, for shifting the phase of power travelling therethrough by equal and opposite amounts, whereby the amplitude of power coupled out of said hybrid element may be varied by adjustment of the phase shift, characterized in that:

each of said first and second channels consists of a single conductive path for microwave power between said input and output hybrid element

wherein each of said first and second paths exclude hybrid elements for splitting power;

one of said conductive paths includes a phase shifter set to shift the phase of power passing therethrough by a quantity phi; and

the other of said conductive paths includes a fixed phase shifter for shifting the phase of power passing therethrough by one hundred eighty degress and a phase shift element set to shift said phase by an amount equal to one hundred eighty degrees minus phi.

4,841,263

BIQUAD BLOCK WITH SWITCHED CAPACITORS WITHOUT CONTINUOUS FEEDBACK LOOP AND WITH NO SENSITIVITY COMPARED WITH THE GAIN OF OPERATIONAL AMPLIFIERS AND THE RATIO OF THE CAPACITANCES

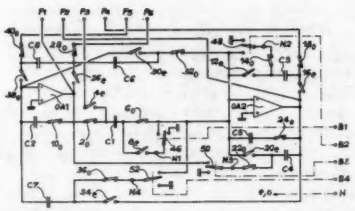
Jan Mulawka, ul. Bernardyn ka 3-M41 02904, Warszawa, Poland; Agnieszka Konczykowska, L'Haye les Roses, and Michel Bon, Verrieres Le Buisson, both of France, assignors to Etat Francais représenté0 par le Ministre Délégué des Postes et Télécommunications (CNET), Moulineaux, France and Jan Mulawka, Warsaw, Poland

Filed Aug. 19, 1988, Ser. No. 234,277

Claims priority, application France, Aug. 28, 1987, 87 12028

Int. Cl.[4] H03H *19/00*

U.S. Cl. 333—173 **10 Claims**



1. Switched capacitor biquad block filter incorporating six input-output connections **P1**, **P2**, . . . , **P6** and a clock input H for receiving a clock signal for controlling the closing and opening of a group of switches, said switches comprising a first family of switches controlled in the open state during a first half-cycle of each cycle of the clock signal and which are controlled in the closed state during a second half-cycle of each cycle of the clock signal and a second family of switches controlled in the closed state during said first half-cycle of each cycle of the clock signal and in the closed state during said second half-cycle of each cycle of the clock signal, said biquad block comprising:

a first operational amplifier **0A1** provided with a noninverting input connected to earth, an inverting input **E1** and an inverting output **S1** connected to the first connection **P1** of the filter,

a second operational amplifier **0A2** provided with a noninverting input connected to earth, an inverting input **E2** and an output **S2** connected to the second connection **P2** of the filter,

a first capacitor **C1** and switches for connecting said capacitor between the output **S1** of the first operational amplifier and the input **E2** of the second operational amplifier during said first hald-cycles of the clock signal and for connecting said capacitor to the connection **P3** and to a node **N1** during said second half-cycles of the clock signal,

a second capacitor **C2** and switches for connecting said capacitor between the input **E1** and the output **S1** of the first operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor solely to the input **E1** of the first operational amplifier during said second half-cycles of the clock signal,

a third capacitor **C3** and switches for connecting said capacitor between a node **N2** and connection **P4** during said first half-cycles of the clock signal and for connecting said capacitor between the input **E2** and the output **S2** of the second operational amplifier during said second half-cycles of the clock signal,

a fourth capacitor **C4** and switches for connecting said capacitor between a node **N3** and the output **S2** of the second operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor between the input **E2** and the output **S2** of the second operational amplifier during said second half-cycles of the clock signal,

a fifth capacitor **C5** and switches for connecting said capacitor between input **E2** and output **S2** of the second operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor solely to the input **E2** of the second operational amplifier during said second half-cycles of the clock signal,

a sixth capacitor **C6** and switches for connecting said capacitor between connection **P6** and input **E2** of the second operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor between output **S1** and input **E1** of the first operational amplifier during said second half-cycles of the clock signal,

a seventh capacitor **C7** and switches for connecting said capacitor between input **E1** of the first operational amplifier and a node **N4** during said first half-cycles of the clock signal and for connecting said capacitor between input **E1** of the first operational amplifier and output **S2** of the second operational amplifier during said second half-cycles of the clock signal,

an eighth capacitor **C3** and switches for connecting said capacitor between connections **P5** and **P6** during said first half-cycles of the clock signal and for connecting said capacitor between input **E1** and output **S1** of the first operational amplifier during said second half-cycles of the clock signal, and

four two-position switches controlled by signals applied to terminals **B1**, **B2**, **B3**, **B4** of the biquad block, the first switch connecting node **N1** to input **E2** of the second operational amplifier or to earth, the second switch connecting node **N2** to input **E2** of the second operational amplifier or to earth, the third switch connecting node **N3** to output **S1** of the first operational amplifier or to earth and the fourth switch for connecting node **N4** to input **E2** of the second operational amplifier or to earth.

4,841,264

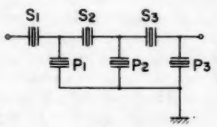
LADDER-TYPE CERAMIC FILTER

Michitaka Oshikawa, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 224,499

Int. Cl.[4] H03H *9/58*

U.S. Cl. 333—189 **2 Claims**



1. A ladder type piezoelectric ceramic filter comprising an input terminal, an output terminal and a plurality of resonator sections connected between said input terminal and said output terminal, each section comprising a series resonance element

and a parallel resonance element, the resonance frequency of a series resonance element provided in a section located closest to said input terminal being lower than the resonance frequency of series resonance elements provided in other sections, the antiresonance frequency of the series resonance element provided in said section located closest to said input terminal being higher than that of said series resonance elements provided in other sections, the resonance frequency of a parallel resonance element provided in a section located closest to said output terminal being lower than that of parallel resonance elements provided in other sections, and the antiresonance frequency of said parallel resonance element provided in said section located closest to said output terminal being higher than that of parallel resonance elements provided in other sections.

4,841,265

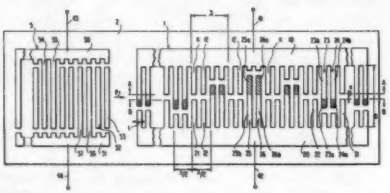
SURFACE ACOUSTIC WAVE FILTER

Takaya Watanabe, and Shigeo Fushimi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,024

Int. Cl.[4] H03H *9/145, 9/64*

U.S. Cl. 333—194 **14 Claims**



1. A surface acoustic wave (SAW) filter having a piezoelectric substrate and a conductive transducer formed over said piezoelectric substrate, wherein:

said transducer has first and second bus bars arranged in parallel at a prescribed interval from each other;

a plurality of pairs of first electrode fingers having the same lengths, vertically extending from said first bus bar and arranged at prescribed intervals in the lengthwise direction of said first bus bar;

a plurality of pairs of second electrode fingers having the same lengths, vertically extending from said second bus bar, arranged at said prescribed intervals in the lengthwise direction of said second bus bar, the tips of these paired second electrode fingers being positioned opposite to those of said paired first electrode fingers;

a plurality of first weighted electrode pairs positioned between two adjacent pairs of said first electrode fingers, each pair of said first weighted electrodes comprising a pair of first electrode sections whose lengths of overlap with said paired second electrode fingers are determined by the negative tap coefficients of an FIR filter having a desired lowpass characteristic and a pair of second electrode sections positioned on the elongations of these first electrode sections, one end of each such second electrode section being connected to the first bus bar; and

a plurality of second weighted electrode pairs positioned between two adjacent pairs of said second electrode fingers, each pair comprising a pair of third electrode sections positioned between two opposite ones of said first electrode pairs, whose lengths of overlap with said paired first electrodes are determined by the positive tap coefficients of said FIR filter, and a pair of fourth electrode sections positioned on the elongations of said electrode sections, one end of each such fourth electrode section being connected to the second bus bar.

4,841,266

CIRCUIT BREAKER HAVING AN ELECTRODYNAMICALLY OPENING CONTACT SYSTEM

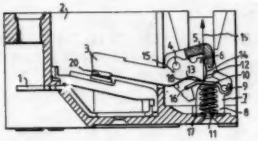
Hans-Jürgen Wulff, Hohenwestedt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 172,932

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708807

Int. Cl.[4] H01H *75/00*

U.S. Cl. 335—16 **6 Claims**



1. A circuit breaker comprising

(a) a housing;

(b) a stationary contact mounted in the housing;

(c) an operating shaft disposed in the housing and rotatable about a first axis of rotation;

(d) a movable contact including a contact arm pivotally held in said operating shaft for rotation about a second axis of rotation relative to said operating shaft from an on position in which said stationary and movable contacts are in engagement, into a tripped position in which said contacts are separated; said contact arm being movable, by rotation of said operating shaft about said first axis of rotation, into and out of said on position and an off position other than said tripped position; said contact arm further having a terminus including a rounded corner and an adjoining rounded engagement face;

(e) a structural unit stationarily supported in said housing and comprising a spring having a stationarily supported first end and a second end and a transfer lever having an end pivotally supported for rotation about a third axis of rotation; said lever being disposed between said second end of said spring and said terminus of said contact arm and engaging said rounded corner or said rounded engagement face of said terminus dependent on the position of said contact arm for transmitting a torque from said spring to said contact arm about said second rotary axis said transfer lever having a first engagement portion adjoining said third rotary axis and a second engagement portion bent from said first engagement portion in a direction towards said spring.

4,841,267

DEFLECTION APPARATUS FOR CATHODE RAY TUBE

Seiji Watabe; Isao Yokoyama; Tsutomu Maeda; Koichi Shibuya, and Sumio Takahashi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 240,145

Int. Cl.[4] H01F *7/00*

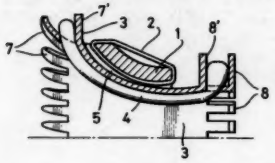
U.S. Cl. 335—210 **3 Claims**

1. A deflection apparatus for cathode ray tube characterized by comprising:

(a) a trumpet-shaped deflection yoke having plural guide grooves on the inner surface extending generally in the direction of axis of cathode ray tube for retaining scanning windings therein,

(b) one of the horizontal and vertical scanning windings retained in said guide grooves,

(c) a trumpet-shaped insulator which is arranged on the inner surface of said deflection yoke and



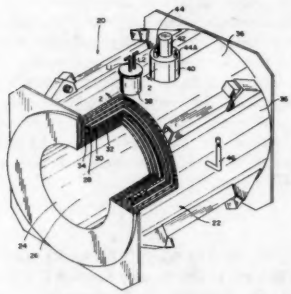
(d) the other scanning windings arranged on the inner surface of said insulator.

4,841,268

MRI MAGNET SYSTEM WITH PERMANENTLY INSTALLED POWER LEADS

Sibley C. Burnett, Cardiff; John R. Purcell, San Diego; Bruce C. Breneman, San Diego, and Raymond E. Sarwinski, San Diego, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Sep. 28, 1987, Ser. No. 101,517
Int. Cl.[4] H01F 7/22
U.S. Cl. 335—216 **11 Claims**



1. A magnet system for providing a magnetic field comprising:

a vacuum vessel;

a cryogenic containment vessel supported within said vacuum vessel and containing a main coil having a first end and a second end and formed of superconductive wire for providing said magnetic field, along with a quantity of liquid helium to maintain said wire below its critical temperature, the pressure inside said containment vessel being greater than atmospheric pressure;

a pair of power leads for supplying energy to said coil from a power supply outside said vacuum vessel and for taking energy from said coil to power dissipative means disposed outside said vacuum vessel, each of said leads connected to one of said coil ends, extending outside said vacuum vessel and comprising an elongate metallic tube; and

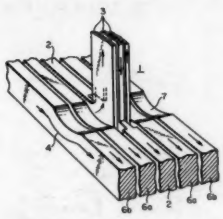
means responsive to the passage of electrical current through the tubes of said leads to cause helium gas resulting from the boiling of liquid helium in said containment vessel to be vented to atmosphere through said tubes thereby cooling said tubes.

4,841,269

COIL DEVICE

Kazuo Kuno, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 1, 1988, Ser. No. 278,450
Int. Cl.[4] H01F 5/00
U.S. Cl. 335—299 **5 Claims**



1. A coil device comprising:

feeders connectable to a power source and adapted to supply electric current;

a coil conductor section connected at both ends to said feeders and wound into a coil in a position adjacent to said feeders; and

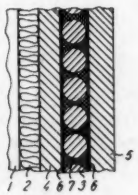
deformed sections provided in at least one of the coil conductors of said coil conductor section at positions in the vicinity of said feeders in such a manner as to generate current loops which cancel an error magnetic field generated by a current loop which flows in said feeders.

4,841,270

HEAT-DISTRIBUTING WINDING

Ove Hansen, Bogense, Denmark, assignor to Transpower A/S, Denmark

Filed Jan. 15, 1988, Ser. No. 144,005
Claims priority, application Denmark, Jan. 19, 1987, 267/87
Int. Cl.[4] H01F 27/22
U.S. Cl. 336—61 **3 Claims**



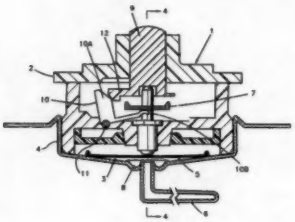
1. An annular core transformer comprising; a cylindrical core with external and internal cylindrical surfaces and end surfaces connecting said cylindrical surfaces, a toroidal electrical winding wound on said core with parts of the winding extending along the cylindrical surfaces of the core, and parts of the winding extending along the end surfaces of the core the turns of the winding mainly following the generatrix direction along the cylindrical surfaces, at least one heat heat distributing winding concentric with the core and made from juxtaposed turns of wire-shaped heat conducting material substantially perpendicular to and in heat-conductive contact with, but electricaly insulated from the electrical winding parts extending along the cylindrical external surface of the core and mainly in the generatrix direction of said core , and wherein a heat distributing winding is applied both at an inner surface and an outer surface of the electrical winding parts extending along the cylindrical external surface of the core.

4,841,271

TRIP-FREE RESETTING MECHANISM FOR AN ON-OFF UNIT

Robert F. Pursell, Plymouth, England, assignor to Ranco Incorporated of Delaware, Dublin, Ohio

Filed Jan. 12, 1987, Ser. No. 2,161
Claims priority, application United Kingdom, Jan. 17, 1986, 8601115
Int. Cl.[4] H01H *37/38*
U.S. Cl. 337—320 5 Claims



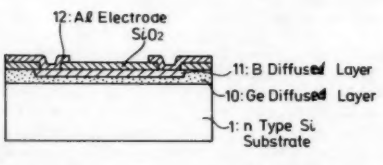
1. A trip-free mechanism for resetting an on-off circuit breaking switch unit breakable by the tripping of an actuator element from a first condition to a second condition, the mechanism comprising a resetting member engageable and movable to apply a resetting force to the actuator element to reset the latter from its second condition to its first condition, and restraining means acted upon by the resetting member when said resetting member applies the resetting force to the actuator element, said restraining means having at least a portion moved in response to resetting movement of the resetting member to maintain the unit in its broken condition until the resetting member is disengaged upon resetting of the actuator element.

4,841,272

SEMICONDUCTOR DIFFUSION STRAIN GAGE

Hideaki Yamagishi, and Mayumi Nomiyama, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Aug. 26, 1987, Ser. No. 89,504
Claims priority, application Japan, Sep. 25, 1986, 61-226632
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—2 3 Claims



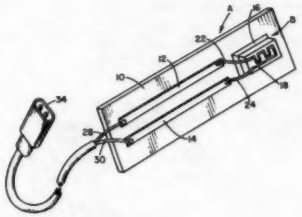
1. A semiconductor strain gage comprising a silicon substrate, wherein impurity atoms of the IV group forming neither donors nor acceptors are doped in said silicon substrate, and wherein a diffused resistance region is formed in the impurity doped region.

4,841,273

HIGH TEMPERATURE SENSING APPARATUS

Paul J. Horton, Moorpark, Calif., assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Dec. 18, 1987, Ser. No. 134,881
Int. Cl.[4] G01K *01/14;* H01C *01/012*
U.S. Cl. 338—28 8 Claims



1. A temperature sensing device for high temperatures comprising:

an elongated ceramic member having a substantially flat surface along the length thereof;

a pair of elongated spaced-apart electrically conductive strips extending along said substantially flat surface and being fused along the entire length thereof to said ceramic member;

variable resistance means having a resistance that varies with temperature and being mounted on said ceramic member;

said variable resistance means being in the form of a resistance thermometer-type of sensing device through which a variable excitation current flows that is proportional to the temperature thereof and which is heated by a heat source whose temperature is to be sensed and that is completely separate from said temperature sensing device; and

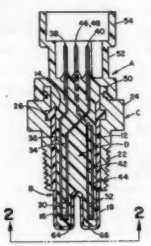
connecting means for connecting said conductive strips in electrically conductive relationship with said resistance means, said connecting means comprising precious metal wires welded to said conductive strips and to said variable resistance means.

4,841,274

TEMPERATURE RESPONSIVE PROBE APPARATUS

Charles Yagher, Jr., Lexington, and Kenneth C. Day, Mansfield, both of Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Dec. 21, 1987, Ser. No. 135,247
Int. Cl.[4] G01K *1/14, 7/16*
U.S. Cl. 338—28 7 Claims



1. Temperature responsive apparatus comprising an elongated hollow plastic shell having an open end and a closed end portion, a pair of spaced-apart probes on said closed end por-

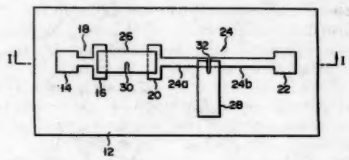
tion, and thermistor received in each said probe to sense fluid temperature, and plastic material filling said shell.

4,841,275

THICK-FILM INTEGRATED CIRCUIT DEVICE CAPABLE OF BEING MANUFACTURED BY MEANS OF EASY-TO-PERFORM TRIMMING OPERATION

Mitsuru Murata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 1, 1987, Ser. No. 127,160
Claims priority, application Japan, Dec. 2, 1986, 61-287128
Int. Cl.[4] H01C *10/100*
U.S. Cl. 338—195 6 Claims



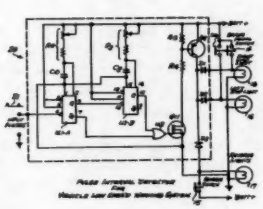
1. A thick-film integrated circuit device comprising:
an insulating substrate;
first and second conductors formed on said insulating substrate and spaced apart from each other, at least one of said conductors having a substantially elongated intermediate portion;
trimming resistor formed on said insulating substrate and having two ends overlapping and electrically connected to said first and second conductors for coarsely adjusting the resistance of the integrated circuit device; and
function-trimming resistor formed on said insulating substrate in the form of a strip having two ends, one function-trimming resistor end extending from and electrically contacting said substantially elongated intermediate portion, for finely adjusting the resistance of the integrated circuit device, said function-trimming resistor having a negligibly low pre-trimmed resistance which is at most equal to one-tenth of the resistance of said trimming resistor.

4,841,276

VEHICLE LOW SPEED WARNING SYSTEM

Roy P. Abel, 1315 N. Columbus #13, Glendale, Calif. 91202, and Warren W. Welcome, Tarzana, Calif., assignors to Roy P. Abel, Glendale, Calif.

Continuation-in-part of Ser. No. 745,194, Jun. 17, 1985, Continuation of Ser. No. 741,815, Jun. 6, 1985. This application Nov. 6, 1987, Ser. No. 119,298
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—466 6 Claims



6. In a vehicle slow speed warning system having a means for generating a train of signal pulses at a rate proportional to the vehicle's speed, and having a vehicular brake light, the improvement comprising a pulse interval detector comprising:
a microcomputer system including
a microprocessor for comparing the sum of a number of signal pulses in a predetermined time interval with a constant number stored in the microprocessor.
said microprocessor including means for generating a control signal,
said control signal responsive to the result of the comparison made by said microprocessor to apply operating power to electronic output stages included in said system for said vehicular brake light.

4,841,277

OMNIBUS ALARM SIGNALING SYSTEM

John A. Wilson, Scotch Plains, N.J., assignor to The Hijack Light, Inc., Newark, N.J.

Filed Sep. 3, 1987, Ser. No. 92,677
Int. Cl.[4] B60R *25/10*
U.S. Cl. 340—426 5 Claims

1. An alarm signaling system for taxi cabs, buses and similar such motor vehicles carrying passengers for hire, comprising:
illumination means mounted on said motor vehicle and capable of providing a visual alert to persons located outside said vehicle;
first switch means available to an operator within said motor vehicle to activate said illumination means from within said vehicle; and
second switch means available to deactivate said illumination means, but only available to deactivate said illumination means from without said motor vehicle;
wherein said first and said second means are incorporated as part of an included control apparatus which also provides a cycling timing signal to periodically energize said illumination means once said first switch means is activated; and
wherein said illumination means is mounted on said motor vehicle to provide a visual alert illuminating the roadway under said vehicle once energized by said first switch means.

4,841,278

SELF-ILLUMINANT DELINEATOR AND DELINEATOR SYSTEM BY USE THEREOF

Hirofumi Tezuka; Kouji Nogami, and Toshihide Koyano, all of Shiga, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation-in-part of Ser. No. 748,730, Jun. 25, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 29,372
Claims priority, application Japan, Jun. 27, 1984, 59-97524[U]; Jul. 30, 1984, 59-118315[U]; Jan. 31, 1985, 59-19070
Int. Cl.[4] E01F *9/00*
U.S. Cl. 340—908.1 12 Claims

1. A self-illuminant delineator comprising a plurality of light-emitting diodes disposed on a sign surface of said delineator; power supply means for powering the light-emitting diodes including a solar cell module disposed on the top surface of said delineator and covered with a transparent cover and a rechargeable battery for storing power; control means for controlling the flickering of the light-emitting diodes; and communication means for periodically transmitting or receiving a reference signal to synchronize the control means for the flickering of said light emitting diodes; wherein the power supply means also supplies power to the communication

means, and the control means further includes timing means for controlling duration during which power is supplied to the communication means from the power supply; wherein said solar cell module is substantially horizontally disposed on the top surface of said delineator and said transparent cover for covering said solar cell module is substantially oval hemi-

spheric or substantially hemispheric and is mounted and fixed on the top surface of said delineator so as to provide a convex external surface; and further wherein the solar cell module supplies power to said rechargeable battery and functions as an optical sensor for generating a signal when the incident light drops below a predetermined level.

4,841,279

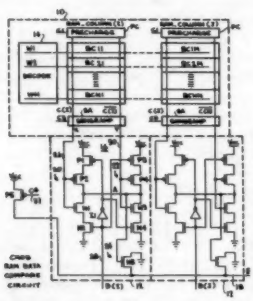
CMOS RAM DATA COMPARE CIRCUIT

Donald M. Walters, Jr., Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1987, Ser. No. 115,130

Int. Cl.[4] G06F *7/02*

U.S. Cl. 340—146.2 **11 Claims**



1. A data compare circuit for use with a complementary metal-oxide-semiconductor random-access-memory (CMOS RAM) to check the equality of a bit field in an accessed RAM word against data values, said circuit comprising:

an inverter (I1) having an input connected to receive a true data signal and an output to provide a complementary data signal;

a first group of series-connected transistors formed of a first P-channel transistor (P1), a second P-channel transistor (P2), a first N-channel transistor (N1) and a second N-channel transistor (N2);

said first P-channel transistor (P1) having its source connected to a supply potential (VCC), its gate connected to the output of the inverter (I1), and its drain connected to the source of said second P-channel transistor (P2);

said second P-channel transistor (P2) having its gate connected to a first sense node (X) and its drain connected to an intermediate node (A);

said first N-channel transistor (N1) having its drain connected to the intermediate node (A), its gate connected to the first sense node (X), and its source connected to the drain of said second N-channel transistor (N2);

said second N-channel transistor (N2) having its gate connected to the input of the inverter (I1) and its source connected to a ground potential;

a second group of series-connected transistors formed of a third P-channel transistor (P3), a fourth P-channel transistor (P4), a third N-channel transistor (N3), and a fourth N-channel transistor (N4);

said third P-channel transistor (P3) having its source connected to the supply potential (VCC), its gate connected to the input of said inverter (I1), and its drain connected to the source of said fourth P-channel transistor (P4);

said fourth P-channel transistor (P4) having its gate connected to a second sense node (Y) and its drain connected to the intermediate node (A);

said third N-channel transistor (N3) having its drain connected to the intermediate node (A), its gate connected to the second sense node (Y) and its source connected to the drain of said fourth N-channel transistor (N4);

said fourth N-channel transistor (N4) having its gate connected to the output of the inverter (I1) and its source connected to the ground potential; and

an N-channel switching transistor (N5) having its source connected to the ground potential, its gate connected to the intermediate node (A) and its drain connected to an output line (18) for generating an equal signal (E) which is discharged from a precharged high voltage level to a low logic level when the bit field in the accessed RAM word and the data values are different.

4,841,280

VISUAL DISPLAY APPARATUS FOR INFORMATION ITEMS

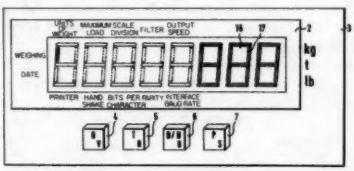
Bernhard Hermann, Schoemberg; Herbert Muerdter, Albstadt; Walter Ehresmann, Albstadt, and Manfred Kammerer, Albstadt, all of Fed. Rep. of Germany, assignors to August Sauter GmbH, Ebingen, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 84,016

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627394

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—706 **22 Claims**



1. An apparatus for visual display of information items on a display field of a multisegment bar display, wherein the segment bars of said display are selectively actuatable for display depending on the particular information item which is to be displayed, comprising:

a display field;

a multisegment bar display of individual of individual segment bars arranged on said display field to form a plurality of alphanumeric characters linearly arrayed in a block within said display field; and

permanent markings on said display field, each permanent marking indicating a specific information item;

a plurality of said individual segment bars forming said alphanumeric characters also being operatively associated

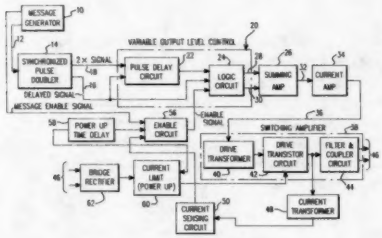
with corresponding ones of said permanent markings, so that actuation of an individual segment bar displays the respective information item of the corresponding permanent marking.

4,841,281

APPARATUS FOR CONTROLLING A SWITCHING AMPLIFIER

Waymon A. Melvin, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 16, 1987, Ser. No. 64,148
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—310 A **16 Claims**



16. A switching amplifier and amplifier control apparatus for use on a power line communication system, comprising:

means for generating a message signal for transmission over said power line communication system, said message signal containing a plurality of information bits and having a preselected frequency and phase associated therewith, said message generating means further generating a message enabling signal in conjunction with said message signal;

means for amplifying said message signal;

means for driving said amplified message signal into said power line communication system;

logic means in electrical communication with said message signal and being effective upon reception of said message enabing signal, for conditioning said message signal such that under normal operating conditions, said message signal can be communicated to said amplifying means;

means for sensing an overcurrent condition at said driving means and generating a current limit signal in response thereto;

means for limiting current through said driving means until the expiration of a power up time delay value, such power up time delay value having a duration which is preselected to a value that allows for component settling;

means for measuring said power up time delay value and generating a power up time delay signal until said power up time delay value has expired; and

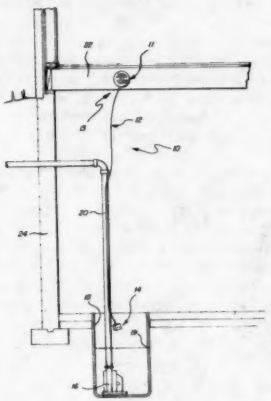
means for generating an enable signal and a disable signal, generating said enable signal upon sensing the absence of said current limit signal and the absence of said power up time delay signal, said enable and disable signal generating means further being effective such that, upon sensing at least one of said limit current signal and said power up time delay signal, said enable and disable signal generating means generates said disable signal such that said driving means is prevented from communicating said message signal to said power line communication system.

4,841,282

SMOKE AND LIQUID ALARM

Gustave A. Reis, 5270 Daniels, Troy, Mich. 48098

Filed Jul. 5, 1988, Ser. No. 215,419
Int. Cl.[4] G08B *19/00, 17/10*
U.S. Cl. 340—521 **9 Claims**



1. For use with a smoke alarm of the ionization type having an ionization chamber which acts in response to the pressure of a predetermined level of ionization therein to lower the impedance thereof and circuitry operatively associated therewith to cause an alarm signal to be sounded in response to said lowered impedance, a liquid level detector comprising:

a sensor head having two spaced apart electrodes, each in electrical communication with an electrically conductive lead, said leads being connected to either side of the ionization chamber so that the electrodes are in parallel therewith,

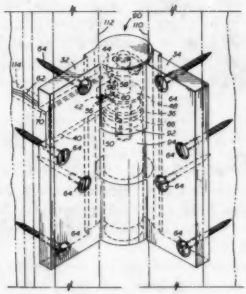
whereby liquid in contact with the electrodes establishes a conductive path therebetween, thereby completing the alarm circuit and causing sounding of the alarm signal.

4,841,283

SECURITY HINGE UTILIZING CONCEALED RADIATIVE SENSING TO DETECT HINGE POSITION

Leszek Bubliewicz, San Antonio, Tex., assignor to Southern Steel Company, San Antonio, Tex.

Filed Dec. 21, 1987, Ser. No. 136,091
Int. Cl.[4] G08B *13/08, 13/18*
U.S. Cl. 340—545 **12 Claims**



1. A hinge construction for mounting a door to a door frame

or the like and providing for detection of changes in hinge leaf position, comprising:

(a) a hinge having a first and a second leaf, each leaf having a leaf body and at least one knuckle, said hinge knuckles being adjacent to each other and pivotally connected, thereby defining a hinge pivotal axis, each leaf being moveable relative to the other; said first leaf including a pocket formed in said leaf body and extending into said knuckle;

(b) a radiative sensing means, including a radiative emitter means and radiative detector means mounted and concealed within said pocket and knuckle of said first hinge leaf, said sensing means being adapted to provide a change-of-position signal in response to an actuating means and adapted for connection to external electrical circuits;

(c) an actuating means mounted and concealed within said second hinge leaf knuckle to rotate with the rotation of said second hinge leaf, said actuating means extending into said first hinge leaf knuckle, the rotation of said actuating means shielding said radiative detector means from said radiative emitter means when said hinge is opened, thereby causing said radiative sensing means to form a change-of-position signal indicative of an open-hinge position; and

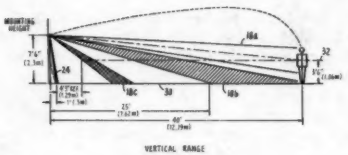
(d) a means for resetting said actuator means.

4,841,284

INFRARED INTRUSION DETECTION SYSTEM INCORPORATING A FRESNEL LENS AND A MIRROR

Jack L. Biersdorff, Los Altos, Calif., assignor to C & K Systems, Inc., San Jose, Calif.

Filed Oct. 19, 1987, Ser. No. 110,136
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—567 **5 Claims**



1. In an infrared intrusion detection system for mounting at a distance displaced from a detection plane, wherein said system having a first fresnel lens having a plurality of lines of focus and a focal point along said plurality of lines of focus for focusing infrared radiation, wherein the improvement comprising:

a detector in said detection system, located at said focal point; and

a curvilinearly-shaped mirror means spaced apart from said detector in the direction away from said detection plane for receiving infrared radiation from said detection plane closer to said detector than the infrared radiation focused through said fresnel lens, and for reflecting and focusing said detected infrared radiation directly onto said detector.

4,841,285

TILT-RESPONSIVE DISPLAY CASE ALARM

Jack R. Laut, P.O. Box 2555, Dunnellon, Fla. 32630

Filed May 3, 1988, Ser. No. 189,550
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—571 **6 Claims**

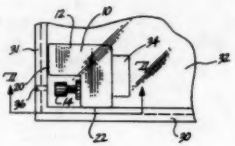
1. A new and improved display case alarm adapted to be mounted in an interior corner portion of a display case, comprising:

a generally L-shaped housing;

said housing having first and second legs each having rectangular interior and exterior side wall portions and a rectangular end face;

an enable/disable switch extending form said interior side wall portion of said first leg, said enable/disable switch located in an enclosed rectangular recess when said L-shaped housing is mounted in an interior corner portion of a display case;

an audible alarm in said housing, said audible alarm having a grill portion extending through said exterior side wall of said first leg;



a mercury switch in said housing, said mercury switch comprising a pool of mercury in a conical recess encapsulated in a block of plastic material, and first and second electrical conductors arranged to be contacted by said mercury pool upon tilting of said housing; and

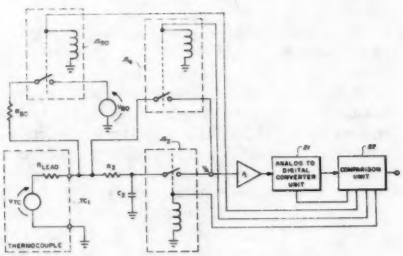
a battery in said housing, said enable/disable switch, said audible alarm, said mercury switch and said battery being connected in series.

4,841,286

APPARATUS AND METHOD FOR DETECTION OF AN OPEN THERMOCOUPLE IN A PROCESS CONTROL NETWORK

Karl T. Kummer, Doylestown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 8, 1988, Ser. No. 153,753
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—653 **13 Claims**



1. Apparatus for verifying operation of a thermocouple, said apparatus comprising:

a voltage source having a known potential;

a resistor having a known resistance;

switch means for periodically inserting a voltage source and a resistor in series with said thermocouple;

voltage means for measuring a first and a second voltage level at preselected times during a switch means cycle, said first voltage being measured when said voltage source and said resistor are coupled to said thermocouple, said second voltage level measured when said voltage source and said resistor are not coupled to said thermocouple; and

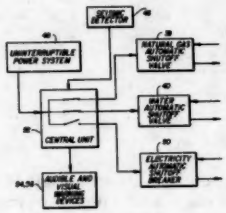
comparison means for comparing said first and said second voltage level.

4,841,287

EARTHQUAKE UTILITIES CUT-OFF CONTROL SYSTEM

Alan Y. Flig, 13127 Bassett St., North Hollywood, Calif. 91605, and Paul Regan, 5541 Willis Ave., Van Nuys, Calif. 91411

Filed Dec. 17, 1987, Ser. No. 134,052
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—690 15 Claims



1. A fail-safe control system for automatic cut-off of gas, electric and water utilities in a building in the event of an earthquake, comprising:

(a) an uninterruptible power supply for providing continuous power to said system;

(b) an electrical seismic detector means, being connected to said uninterruptible power supply, and having an output for triggering an electric current upon the occurrence of an earthquake;

(c) a control relay being connected to said seismic detector means and obtaining power from said output of said seismic detector means;

(d) electrically operated gas cut off means, being adapted to be positioned between the main gas supply and the building gas supply, and connected to said uninterruptible power supply, for interrupting the gas supply to the building upon an occurrence of an earthquake detected by said seismic detector means;

(e) electrically operated water cut-off means, being adapted to be positioned between the main water supply and the building water supply, and connected to said uninterruptible power supply, for interrupting the water supply to the building upon an occurrence of an earthquake detected by said seismic detector means;

(f) said gas and water cut off means being normally opened when energized and being closed when de-energized;

(g) first normally closed contact of said control relay being connected in series with said gas cut-off means, and said first contact being opened when said control relay is energized by said seismic detector means upon an occurrence of an earthquake detected by said seismic detector means, thereby de-energizing and closing said gas cut-off means;

(h) second normally closed contact of said control relay being connected in series with said water cut off means, and said contact being open when said control relay is energized by said seismic detector means upon an occurrence of an earthquake detected by said seismic detector means, thereby de-energizing and closing said water cut off means;

(i) electrically operated breaker trip means, being connected to said uninterruptible power supply, for tripping the main power supply breaker to the building when said breaker trip means is energized upon an occurrence of an earthquake detected by said seismic detector means;

(j) first normally open contact of said control relay being connected in series with said breaker trip means, and said normally open contact being closed when said control relay is energized by said seismic detector means upon an occurrence of an earthquake detected by said detector means, thereby energizing said breaker trip means and tripping the main power supply breaker to the building; and

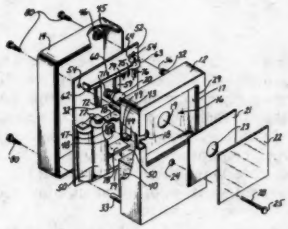
(k) said gas and water cut-off means and said breaker trip means being manually resetable after said seismic detector means has been activated in response to an earthquake.

4,841,288

EARTHQUAKE ILLUMINATING DEVICE

Lyle F. Addicks, 10246 S. Julius Ave., Downey, Calif. 90241

Filed Feb. 22, 1988, Ser. No. 158,635
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—690 8 Claims



1. An illuminating device for use as a precautionary measure in a home located in an area subject to earthquakes, said device comprising:

a battery power supply;

a control gate;

a socket connected across said battery power supply by said control gate;

a light bulb in said socket;

a latching circuit connected to said battery power supply, said latching circuit having a trigger input and an output which normally has a low output voltage level thereon;

a normally-open motion detection switch connecting said battery power supply to the trigger input of said latching circuit;

said latching circuit being actuated by a signal supplied on the trigger input thereof when said motion detection switch is initially closed by the shaking of an earthquake into a latched state to provide a high voltage level on the output thereof;

said control gate operable in response to the high voltage level on the output of said latching circuit to turn on said light bulb; and

a housing for enclosing said device, said housing having a front wall and a back wall;

a light compartment within said housing located opposite a window provided on the front wall thereof;

said light bulb held by said socket so as to extend into said light compartment; and

means for detachably fastening the back wall of said housing to the wall of a home;

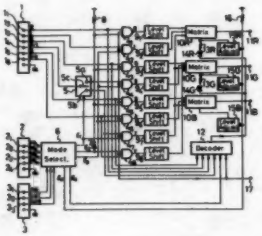
whereby when an earthquake occurs during the night hours that is severe enough to knock out the utility power for the home the housing enclosing the device can be readily removed from the wall of the home and used as a portable light source.

4,841,289

INTERFACE CIRCUIT FOR ADAPTING A MULTI-SCAN MONITOR TO RECEIVE COLOR DISPLAY DATA FROM VARIOUS TYPES OF COMPUTERS

Koji Kambayashi, Chiba; Nobuyuki Okamoto, Tokyo, and Kenichiro Kawanami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 6, 1987, Ser. No. 47,679
Claims priority, application Japan, May 12, 1986, 61-107994
Int. Cl.[4] H04N 9/12
U.S. Cl. 340—703 4 Claims



1. A monitor interface circuit for connection between one of a plurality of different types of external sources of display data signals and a display monitor in order to adapt the monitor to any one of the external sources, the interface circuit selecting only one of the different types of external sources, wherein the interface circuit comprises:

(a) display data input circuit means which is capable of receiving various types of incoming display data signals from any of the external sources;

(b) mode signal input circuit means which is capable of receiving mode information signals from any of the external sources which are associated with said incoming display data signals;

(c) mode control signal generating means connected to said mode signal input circuit means for generating a plurality of mode control signals in response to each received mode information signal;

(d) signal mixing means for mixing said display data signals from said display data input circuit means in accordance with said mode control signals; and

(e) signal output circuit means connected to said signal mixing means for generating display signals for the monitor corresponding to three primary colors of red, green and blue.

4,841,290

DISPLAY UNIT

Masaaki Nakano; Syoyu Watanabe; Yusaku Saito, and Syuji Iwata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,032
Claims priority, application Japan, Sep. 25, 1986, 226767
Int. Cl.[4] G06K 9/16
U.S. Cl. 340—707 2 Claims

1. A display unit with position detecting capabilities, said display unit comprising:

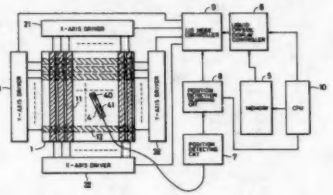
a flat-plate-shaped display panel having X-Y matrix electrodes consisting of two groups of electrodes which are arranged in a crossed-grid fashion to cover a major portion of said display panel;

display-signal applying means for applying display signals to said X-Y matrix electrodes;

current applying means for applying a current having a.c. components to at least one group of said X-Y matrix electrodes in such a manner that said current is sequentially applied to respective one of said electrodes in said at least one group, in a predetermined sequential order;

an input pen with magnetic flux detecting means for detecting magnetic flux associated with a current flowing in an electrode at a matrix location where said input pen is applied;

phase comparison means for comparing a phase of said



current applied to said electrodes with that of an output signal of said magnetic flux detecting means; and

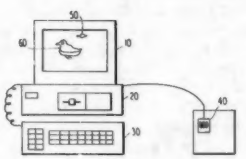
position detecting means for detecting the position of said input pen on said display panel according to an output signal of said phase comparison means.

4,841,291

INTERACTIVE ANIMATION OF GRAPHICS OBJECTS

Scott R. Swix, Atlanta, and Leroy A. Krueger, Marietta, both of Ga., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 21, 1987, Ser. No. 98,653
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—725 9 Claims



1. A method of interactively creating an animated display on a computer graphics screen comprising the steps of:

selecting a graphics object from a display of graphics objects on said graphics screen or from a graphics object table stored in memory;

moving said graphics object on said graphics screen by means of a pointing device;

recording said movements of said graphics object on said graphics screen in memory;

selecting an operation to perform on said graphics object at a particular location on said graphics screen;

recording said operation on said graphics object and the location on the graphics screen where the operation is to be performed; and

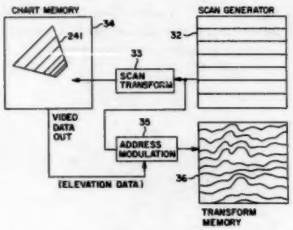
playing back said movement and said operation on said graphics object on said graphics screen at a later time.

4,841,292

THIRD DIMENSION POP UP GENERATION FROM A TWO-DIMENSIONAL TRANSFORMED IMAGE DISPLAY

John R. Zeno, New York, N.Y., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 11, 1986, Ser. No. 895,065
Int. Cl.[4] H04N *15/00*
U.S. Cl. 340—736 4 Claims



1. Method of providing an image on an electronic display, characterized by:

(a) encoding the image as a series of data elements corresponding to coordinate locations;

(b) storing the data elements in a first memory;

(c) generating a first scan pattern;

(d) selecting a scan transformation;

(e) generating a secondary scan pattern by modulating the first scan pattern;

(f) obtaining the data elements corresponding to the secondary scan pattern from the first memory; and

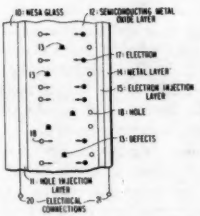
(g) displacing the secondary scan pattern to generate representations of third dimensional image features by modulating the secondary scan pattern with predeterminted bits of said data elements to thereby provide an image signal showing displacement from the secondary scan pattern for display on a display surface.

4,841,293

PROCESS FOR DISPLAYING INFORMATION

Masaaki Takimoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1987, Ser. No. 21,281
Claims priority, application Japan, Mar. 3, 1986, 61-45617
Int. Cl.[4] G09G *3/16*
U.S. Cl. 340—763 26 Claims



1. A process for displaying information, comprising the steps of:

providing a layer of a semiconducting oxide disposed between an electron injection layer and a hole injection layer, said electron injection layer containing a metal oxide in a fine particulate form;

selectively applying a potential difference across the oxide layer with the electron injection layer being negatively biased relative to the hole injection layer to create an image by the dual injection of electrons and holes into the oxide layer, the image being formed by the trapping of electrons in color center promoting structural defects in the oxide layer; and

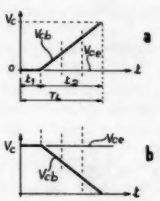
erasing the image by applying a potential difference of opposite polarity across the electron and hole injection layers.

4,841,294

ACTIVE MATRIX DISPLAY SCREEN PERMITTING THE DISPLAY OF GRAY LEVELS

Jean-Frédéric Clerc, Saint-Egreve, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Feb. 17, 1987, Ser. No. 15,369
Claims priority, application France, Feb. 17, 1986, 86 02103
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—793 3 Claims

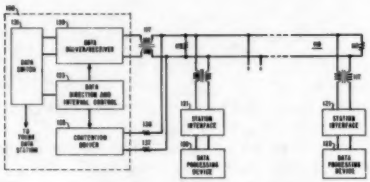


1. An active matrix display screen comprising a first wall on which are deposited a matrix of N by P electrodes forming the first plates of capacitors, N addressing columns and P addressing rows, NP control transistors each having a drain (D), a gate (G) and a source (S), the drain (D) of each transistor being connected to the plate of one of the capacitors, the source to one of the columns and the gate to one of the rows; a second wall on which is deposited a counterelectrode forming the second plate of the capacitors; a first control circuit able to successively apply to the N rows a voltage Ve able to make the transistors of each row on for a time T_L, the control of the N rows constituting a frame of duration $Tr=NT_L$; a second control circuit able to apply to the counterelectrode a voltage Vce successively assuming two values, namely a value 0 and and a value Vc, the voltage Vce passing from one to the other of these values either following each frame, or following each row; and a third control circuit able to apply to the P columns for the entire control time of a row, a set of P voltages, said screen being characterized in that the third control circuit comprises a circuit supplying a voltage Vcb having a pedestal of duration t_1 of value equal to the voltage Vce applied to the counterelectrode and for a duration t_2 a ramp-like voltage passing linearly from said voltage Vce to a voltage differing from Vce by a quantity Vc, the total duration t_1+t_2 of the voltage Vcb being equal to the control time T_L of a row; and secondary column control circuits connected between said third control circuit and each column and which transmit to each column said voltage Vcb for a time which can assume a series of discrete values between t_1, in which case a black display is obtained, and T_L in which case a white display is obtained, each intermediate discrete value between t_1 and T_L corresponding to a gray display.

4,841,295
LOCAL AREA NETWORK WITH BIASING ARRANGEMENT FOR FACILITATING ACCESS CONTENTION BETWEEN WORK STATIONS CONNECTED TO A COMMON BUS

Robert H. Delaney, Blairstown; Charles R. Kalmanek, Jr., Hoboken, and Robert C. Restrick, III, Hopatcong, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 24, 1986, Ser. No. 890,260
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.5 **16 Claims**



1. A local area data distribution bus accessing arrangement, comprising

a bus having a far end and a near end,

a first termination impedance connected at the far end of the bus,

at least a first and a second station interface connected to the bus intermediate the far end and the near end,

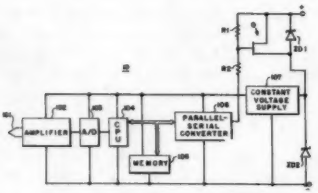
a data driver/receiver coupled through the second termination impedance connected to the near end of the bus and operative to transmit and receive data during intervals of non-contention,

a contention driver, an impedance network connecting the contention driver through the second termination impedance to the near end of the bus, the contention driver being operative during intervals of contention to drive the bus through the impedance network and the second termination impedance to a predetermined and controlled weak logic state level in alternative operation to logic states suppressed by the data driver and selected to enhance contention operation which weak logic state is at such a bias level that an entire length of the bus is at that logic state but wherein each station interface can override that logic state and force the bus to an opposite logic state.

4,841,296
TWO-WIRE TRANSMITTER

Norio Kadoya; Jun Kawachi, both of Yokohama, and Keiji Miyazawa, Kamakura, all of Japan, assignors to Yamatake-Honeywell Co. Ltd., Tokyo, Japan

Filed Jan. 16, 1987, Ser. No. 3,896
Claims priority, application Japan, Jan. 31, 1986, 61-19591
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—870.16 **8 Claims**



1. A two-wire transmitter comprising

a detecting section for detecting a physical variable to be measured to produce a detection output,

first constant voltage device means connected in series with a two-wire transmission path,

signal processing means energized by a voltage supplied by said first constant voltage device means for converting the detection output into representative serial pulse signals,

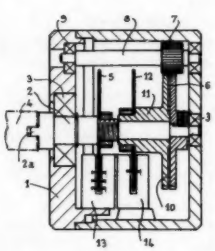
second constant voltage device means connected in series with said two-wire transmission path, and

switching means connected in parallel with said second constant voltage device means and turned on/off by the serial pulse signals for transmitting the serial pulse signals on said two-wire transmission path utilizing a current flowing in said two-wire transmission path.

4,841,297
DISPLACEMENT CODER

Pierre Bourgeaux, Lachat, and Alain Riaud, Lathuille, both of France, assignors to S.A. Des Etablissements Staubli, Faverges, France

Filed Feb. 12, 1988, Ser. No. 155,588
Int. Cl.[4] H03M *1/24*
U.S. Cl. 341—11 **1 Claim**



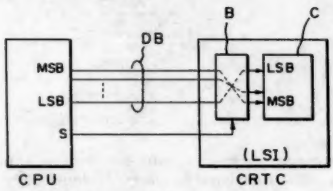
1. A displacement coder for determining the position of a movable component of a machine comprising a casing, a primary shaft rotatably supported within said casing, a first disk means fixedly mounted to said primary shaft, said first disk means having concentric scales, first pulse counting means for detecting said concentric scales of said first disk means, a hub means mounted to said primary shaft and being freely rotatable with respect thereto, a second disk means carried by said hub means, said second disk means having a scale, second pulse counting means for detecting said scale of said second disk means, a first wheel extending outwardly from said hub means and having a plurality of peripheral teeth, a second shaft means disposed within said casing generally parallel to said primary shaft means, a pinion means mounted on said secondary shaft means, said teeth of said first wheel means being drivingly meshed with said pinion means, a second wheel means fixedly mounted to said primary shaft and having a plurality of peripheral teeth, said teeth of said second wheel means being drivingly meshed with said pinion means, said first wheel means having at least one less tooth than said second wheel means so that said second disk means will be rotatably driven in a ratio with respect to said first disk means of less than but substantially equal to one to one, and means for drivingly connecting said principal shaft to the movable component.

4,841,298

BIT PATTERN CONVERSION SYSTEM

Joji Murakami, Kawasaki; Syogo Sibazaki, Yokohama, and Junya Tempaku, Yokosuka, all of Japan, assignors to Fujitsu Limited and Fujitsu Microcomputer Systems Limited, both of Kawasaki, Japan

Filed Dec. 14, 1987, Ser. No. 132,441
Claims priority, application Japan, Dec. 19, 1986, 61-301657
Int. Cl.[4] H03M 7/02
U.S. Cl. 341—51 8 Claims



1. A bit pattern conversion system for converting a sequence of a bit pattern between a central processing unit and a peripheral circuit, comprising:

a data bus line connected between said central processing unit and said peripheral circuit, and

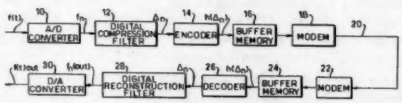
a conversion means provided in said peripheral circuit for converting said sequence of said bit pattern from a most significant bit to a least significant bit, and vice versa, in accordance with a conversion signal.

4,841,299

METHOD AND APPARATUS FOR DIGITAL ENCODING AND DECODING

Charles S. Weaver, Palo Alto, Calif., assignor to Digital Recording Research Limited Partnership, Menlo Park, Calif.

Filed Aug. 31, 1987, Ser. No. 91,544
Int. Cl.[4] H03M 7/40
U.S. Cl. 341—65 21 Claims



1. In a digital decoder for decoding a stream of encoded digital data words which have been encoded using a variable word length code set in which code words comprise a single group of 0 bits and an adjacent single group of 1 bits, the combination comprising:

means responsive to a stream of encoded digital data words for counting the total number of zero bits in the encoded data words to obtain a count of the total number of zero bits in each data word and for temporarily storing the count total, and

means for counting the total number of 1 bits in said encoded data words to obtain a count of the total number of 1 bits in each data word,

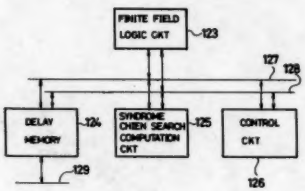
the total number of zero bits counted together with the total number of one bits counted being indicative of the decoded signal.

4,841,300

ERROR CORRECTION ENCODER/DECODER

Hideo Yoshida; Tohru Inoue; Atsuhiro Yamagishi, all of Kamakura; Yoshiaki Oda; Minoru Ozaki, both of Amagasaki, and Toshihisa Nishijima, Kanagawa, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,178
Claims priority, application Japan, Jun. 18, 1986, 61-141679; Jul. 17, 1986, 61-168402; Oct. 8, 1986, 61-240685
Int. Cl.[4] H03M 13/00
U.S. Cl. 341—94 9 Claims



1. An error correction encoder/decoder system comprising:

a memory for storing a received coded word;

a finite field logic circuit for deriving an error locator polynomial and an error evaluator polynomial from said received word, said finite field logic circuit including;

arithmetic and logic means for determining degrees of both of said polynomials, said arithmetic and logic means having a memory for storing intermediate data in calculating both of said polynomials;

Galois logic means responsive to said degrees to solve both of said polynomials for making correction of an error; and

program means for controlling said Galois logic means and said arithmetic and logic means;

a syndrome/Chien search computation circuit for determining a syndrome and an error location from the results output from said finite field logic circuit; and

an address generation circuit arranged in a form of subtraction type counter circuit and responsive to said error location to generate an address in said memory so that the received word at said address may be fetched and corrected.

4,841,301

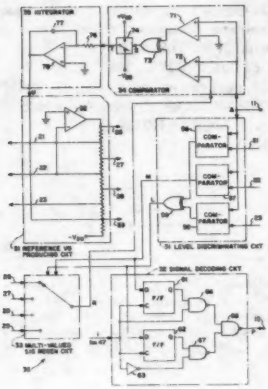
DEVICE OPERABLE LIKE AN AUTOMATIC LEVEL CONTROL CIRCUIT FOR DECODING A MULTIVALUED SIGNAL

Masaki Ichihara, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 716,581, Mar. 27, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 126,864
Claims priority, application Japan, Mar. 30, 1984, 59-60842
Int. Cl.[4] H03M 1/18
U.S. Cl. 341—126 5 Claims

1. A device for use in decoding a received multivalued signal to produce a decoded signal and including a reference voltage producing circuit for producing a plurality of signal discriminating reference voltages and a plurality of signal regenerating reference voltages which are related to one another, a level discriminating circuit responsive to said signal discriminating reference voltages for discriminating said received multivalued signal to produce a local encoded signal, a signal decoding circuit for decoding said local encoded signal into said decoded signal and, a multivalued signal regenerating circuit responsive to said local encoded signal for selecting one of said signal regenerating references voltages to produce a selected regenerated multivalued signal, wherein the improvement comprises a comparator for comparing the voltages of said received and said selected regenerated multivalued signals to produce a result of comparison, an integrator for integrating

said result of comparison to produce a result of integration, and voltage regulating means responsive to said result of integration for simultaneously regulating said signal discriminating and regenerating reference voltages.

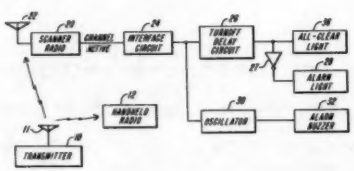


4,841,302

TRANSMITTER DETECTOR FOR USE IN A MOVING VEHICLE

Philip Henry, Las Vegas, Nev., assignor to Gray Electronics, Inc., Green Valley, Nev.

Filed Jan. 30, 1987, Ser. No. 9,947
Int. Cl.[4] H04B *17/00*
U.S. Cl. 342—20 **22 Claims**



1. Apparatus for detecting the proximity of a radio transmitter of known frequency and power to a moving vehicle, comprising:

a radio frequency scanner having a selected channel set to said known frequency so that it provides a channel active signal during the time that a signal is received on said known frequency;

timing means responsive to said channel active signal for generating a timing delay signal having a duration representative of the maximum time for said moving vehicle to pass said transmitter based on an estimated speed of said vehicle and the range of said transmitter; and

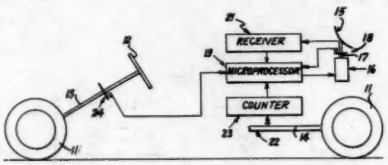
alert means responsive to said channel active signal and said timing delay signal for generating an operator alert during said channel active signal and during said timing delay signal.

4,841,303

LOW COST METHOD AND SYSTEM FOR AUTOMATICALLY STEERING A MOBILE DIRECTIONAL ANTENNA

Roy E. Anderson, Scotia, N.Y., assignor to Mobile Satellite Corporation, Malvern, Pa.

Filed Jul. 1, 1987, Ser. No. 68,531
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 342—359 **21 Claims**



1. A automatic steering control system for a mobile mounted, rotatable, directional antenna for automatically causing the directional antenna to track a geostationary satellite during movement of a vehicle having the directional antenna rotatably mounted thereon, said antenna steering control system comprising:

(a) reversible servo drive motor means mountable on the vehicle for rotating the directional antenna in azimuth in either direction;

(b) antenna rotational position sensing and signal deriving means mountable on the vehicle for developing a first electric signal representative of an actual angular heading of the rotatable directional antenna measured with respect to an arbitrary starting position;

(c) vehicle turn sensing and signal deriving means mountable on the vehicle for developing a vehicle turn signal representative of the magnitude and direction of each turn made by the vehicle measured with respect to an arbitrary initial starting position;

(d) communication signal receiving means coupled to the directional antenna for receiving and processing communication signals detected by the antenna; and

(e) microprocessor means having at least a clock, a mathematical equation processing unit and a memory and a plurality of input terminals respectively coupled to the outputs from the communication signal receiving means, the vehicle turn sensing and signal deriving means and the antenna rotational position sensing and signal deriving means, and having its output connected to control operation of the reversible servo drive motor means;

(f) said microprocessor means being programmed to initially rotate the directional antenna over substantially a full 360 degree scanning angle via the reversible servo drive motor means while intermittently sampline the signal strength of the carrier of a received communication signal with the communication signal receiving means at a sampling rate higher than any expected rate of communication signal variation, and recoring the results in memory in the microprocessor along with a respective directional antenna aheading derived from said antenna rotational position sensing said signal driving means for each sampled signal;

(g) said microprocessor means also being programmed to compare the received signal carrier magnitudes for each sampled heading of the directional antenna and specially recording in memory the respective antenna heading from which the maximum received carrier strength signal was derived, and controlling operation of the reversible servo drive motor means to cause it to rotate the directional antenna so that it bears on the respective heading from which the maximum received carrier strength signal was derived; and

(h) said microprocessor means also being further programmed to process an input signal from said vehicle turn sensor and signal deriving means to develop an antenna

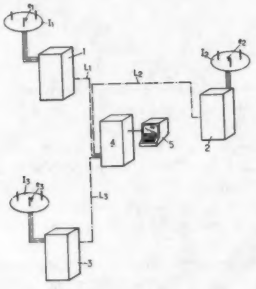
azimuth heading correction for combining the the last known directional antenna azimuth setting for maximum received signal amplitude for use in maintaining the pointing direction of the antenna as the vehicle changes direction during periods when the received signal is degraded or interrupted.

4,841,304

INSTALLATION FOR THE DETECTION AND LOCATION BY INTERFEROMETRY, IN REAL TIME AND AT GREAT DISTANCE OF LIGHTENING STRIKES

Philippe Richard; André Soulage, both of Paris, and Jean Appel, Vanves, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (ONERA), Chatillon S/Bagneux, France

Continuation of Ser. No. 71,311, Jul. 9, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,434
Claims priority, application France, Jul. 10, 1986, 86 10091
Int. Cl.[4] G01J *3/02*
U.S. Cl. 342—460 **12 Claims**



1. Installation for the spacial location by interferometric measurement, in real time and at a great distance, of the electrical component of electromagnetic radiation generated by lightning discharges, said installation comprising, in combination:

(i) at least two and at most three interferometric location stations for determining the angular location of a said lightning discharge and situated at a moderate distance from one another, each station comprising:

at least two fixed receiving antennas for receiving at least one electromagnetic radiation of predetermined wavelength in the UHF-VHF waveband generated by such lightning discharges,

interferometric processing means for measuring, the phase differences between signals produced by the antennas in response to the electromagnetic radiation received thereby and for processing the results of measuring said phase differences to provide information representative of the elevation and azimuth of said electromagnetic radiation,

threshold validation means, sensitive to the magnitude of at least one parameter of the electromagnetic radiation received, for producing an actuating signal when said magnitude is greater than a preestablished threshold,

data storing means, responsive to said threshold validation means, for selecting the information provided by the interferometric processing means only when said magnitude is greater than said preestablished threshold,

means for producing numerical data based on said information as selected by the sorting means, and on information representing the date of the lightning discharge,

processing means for processing said numerical data such that said numerical data is temporarily stored at each station and then transmitted periodically in blocks and at a frequency which is consistent with the discharge activity,

storage means for temporarily storing the numerical data for a time period which is a function of the possible transmission flow rate,

transmission means, in a transmission line, for transmitting the numerical data;

(ii) transmission lines for respectively connecting the location stations to an acquisition center for numerical data, said acquisition center comprising:

respective receiving means for receiving the numerical data transmitted from the location stations,

means for sorting and associating the information having, in a predetermined time span, the same date and transmitted respectively from different location stations, and

storage means, connected to said sorting and associating means, for temporarily storing the sorted and associated information for a time period which is a function of the calculating capacity of the acquisition center,

(iii) calculating means for determining, by triangulation, from the sorted and associated data relating to elevation and azimuth, the spacial position of the lightning discharge which occurred on said date; and

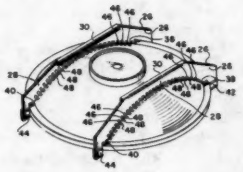
(iv) display means for displaying the results provided by said calculating means.

4,841,305

METHOD OF SECTIONING AN ANTENNAE REFLECTOR

Mark W. Rose, Fort Worth, Tex., assignor to Dalsat, Inc., Plano, Tex.

Filed Feb. 1, 1988, Ser. No. 151,000
Int. Cl.[4] H01Q *15/16*
U.S. Cl. 343—912 **17 Claims**



1. A method of sectioning an antennae reflector, comprising the steps of:

providing a substantially rigid antennae reflector having a curved inner surface for reflecting and focusing electromagnetic energy and a curved outer surface opposite from said inner surface;

providing support means for journally supporting said reflector and positioning said reflector on said support means such that said support means is in contact with a portion of said reflector adjacent to the perimeter thereof and is not in contact with either the curved inner surface or the curved outer surface of the reflector, thereby supporting the reflector in a substantially relaxed state so that only its internal residual stresses determine its shape;

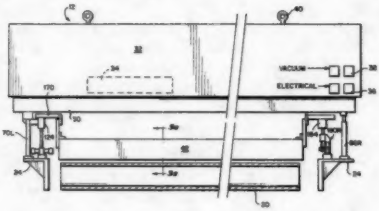
providing 2N number of elongated beams, each of which has relatively flat opposite major surfaces and a minor surface which is curved to conform to the curvature of said outer surface, where N is an integer corresponding to the N number of sections to be formed;

dividing said beams into N number of cooperating pairs and placing each pair in a predetermined position relative to the outer surface so that respective major surfaces of the beams are in facing relationship and the intersection of a plane lying between the facing major surfaces with the outer surface of the reflector defines a corresponding curve along which the reflector is to be sectioned;

identifying said corresponding curves;

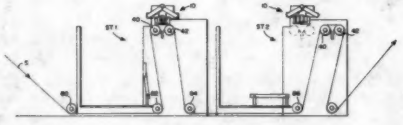
connecting the individual beams of each cooperating pair;
securing each beam pair to the outer surface of the reflector so that a spacing is maintained between the respective minor surfaces of the beams and the outer surface of the reflector; and
sectioning the reflector along each of the corresponding curves to form said N number of sections.

4,841,306
MULTI-COLOR FLUID JET PATTERN GENERATOR FOR TEXTILES
Timothy H. V. Archer, and Richard Sutera, both of Centerville, Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.
Filed Sep. 17, 1987, Ser. No. 97,677
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **24 Claims**



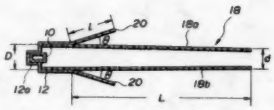
1. Fluid jet printing apparatus for printing on a substrate comprising:
a fluid jet printing head for disposition above a substrate;
a print bar carried by said head including an orifice plate for flowing fluid through the orifices of said plate for deposition on the substrate; and
means carried by said head mounting said print bar for linear movement relative to said head in directions toward and away from said substrate.

4,841,307
FLUID JET APPLICATOR APPARATUS
Louis A. Graham, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Dec. 4, 1987, Ser. No. 128,907
Int. Cl.[4] G01D *15/18;* **B05C** *11/00;* **B11J** *15/24*
U.S. Cl. 346—1.1 **24 Claims**



1. A fluid jet printing apparatus comprising:
a frame;
an elongated fluid jet printhead carried by said frame for printing on a substrate;
a pair of laterally spaced substrate transport rollers carried by said frame substantially coextensive in length with said printhead for locating the substrate, in a first position of said rollers, in opposition to the printhead and with said rollers adjacent opposite sides of the printhead;
means carried by said frame mounting said rollers for movement from said first position into a second position spaced from said printhead with said rollers in said second position locating the substrate in a non-print position relative to said printhead; and
means carried by said frame for moving said rollers from said first position into said second position.

4,841,308
SLOTTED WAVEGUIDE ANTENNA ASSEMBLY
Takashige Terakawa, Yokohama; Mutsumi Takahashi, Kawasaki, and Noriyuki akaba, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 71,038, Jul. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 702,379, Feb. 15, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 229,759
Claims priority, application Japan, Feb. 16, 1984, 59-27722; Feb. 21, 1984, 59-23379; Feb. 25, 1984, 59-34710; Mar. 10, 1984, 59-34689; Mar. 10, 1984, 59-46090
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—771 **15 Claims**



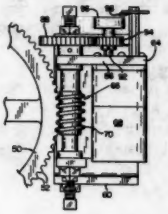
1. A slotted waveguide antenna assembly including a slotted waveguide which is fixed and held, at its back side, by a holder member, which assembly comprises:
a dielectric beam shaper formed of a pair of dielectric plate members, said dielectric plate members having base portions which are supported by said holder member and having forward end portions which extend to project forwardly of said slotted waveguide to define a space therebetween; and
a pair of reflectors provided at the base portions of the respective dielectric plate members and supported by said holder member for reflecting electromagnetic waves radiated through the base portions of the respective dielectric plate members;
said dielectric plate members having a thickness which produces a phase difference, between electromagnetic waves reflected by inner surfaces of the respective dielectric plate members and directed to the space between the dielectric plate members and electromagnetic waves reflected by interfaces at external surfaces of the respective dielectric plate members and directed to the space between the dielectric plate members, the phase difference causing the reflected electromagnetic waves directed to the space between the dielectric plate members to substantially cancel each other;
said pair of dielectric plate members being disposed apart a distance D at the base portions thereof, which differs from a distance d between the dielectric plate members at the forward portions thereof, such that the ratio d/D is given by the following relation $0.8 \leqq d/D < 1$.

4,841,309
ANTENNA WITH MOTORIZED POSITIONER
James D. Burr, Evergreen, Colo., assignor to Echosphere Corporation, Englewood, Colo.
Filed Feb. 19, 1988, Ser. No. 158,203
Int. Cl.[4] H01Q *3/08*
U.S. Cl. 343—766 **8 Claims**

1. A motorized antenna positioner comprising:
a frame,
an adjuster shaft rotatably mounted on said frame and means operatively connected to the adjuster shaft which is shifted by turning of the adjuster shaft to position an antenna,
a worm wheel element with worm wheel teeth operatively connected to the adjuster shaft,

a worm gear element with a worm gear drive,

a mounting for the worm wheel element and worm gear element whereby the axis of the worm gear element is spaced from and extends transversely of the axis of the worm wheel element and the worm gear drive meshes with the worm wheel teeth,



said mounting including biasing means yieldably biasing said elements in a direction urging the axis of the wheel element and the axis of the gear element toward each other,

a motor with output shaft and means drivingly connecting the output shaft of the motor and the worm gear element whereby operation of the motor produces rotation of the worm gear element.

4,841,310

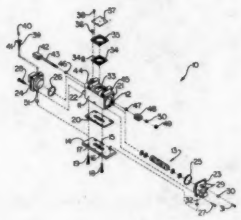
HIGH PERFORMANCE INK JET PRINT HEAD FOR USE IN A HIGH SPEED PRINTER

Arthur R. Hoffman, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1988, Ser. No. 176,118

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 **35 Claims**



1. An ink jet print head for use in a high speed printer mechanism for developing a plurality of ink jet streams in a predetermined array and for producing substantially uniformly timed break-off of said streams to form uniform printing droplets of ink, comprising:

means to define a cavity for enclosing an acoustic wave generator for producing dynamic pressure waves;

means to define an ink reservoir for enclosing a supply of ink under a predetermined static pressure and located so that said dynamic pressure waves from said acoustic wave generator are superimposed on said static pressure;

means to define a plurality of ink nozzles located so they are exposed to said supply of ink in said reservoir under said predetermined static pressure for producing a plurality of streams of ink; and

means to isolate said plurality of ink jet nozzles from said dynamic pressure waves transmitted through said means to define a cavity, while exposing said supply of ink in said reservoir under said predetermined static pressure to said dynamic pressure waves from said acoustic wave generator to produce substantially uniform break-off of said plurality of streams of ink to form droplets of ink for printing, including gasket means formed of a soft material with a durometer value in the order of 60.

4,841,311

LASER BEAM PRINTER WITH COMPACTLY ARRANGED PHOTOSENSITIVE ELEMENT, LASER BEAM EMITTING ELEMENT AND REFLECTIVE ELEMENT

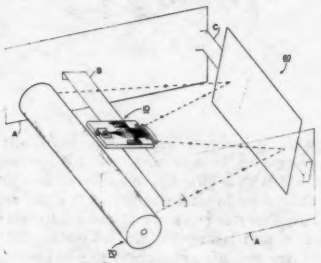
Makoto Suzuki, Nagoya, and Satoshi Urukawa, Suzuka, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 21, 1987, Ser. No. 87,762

Claims priority, application Japan, Sep. 20, 1986, 61-222319

Int. Cl.[4] G01D *9/42*

U.S. Cl. 346—108 **6 Claims**



1. A laser printer comprising:

a laser beam emitting element for emitting a laser beam;

a deflective element, with a variable refractive index, fixed to the laser beam emitting element for deflecting the laser beam emitted from the laser beam emitting element;

a reflective element for reflecting the laser beam deflected by the deflective element; and

a photosensitive element located adjacent the laser beam emitting element and spaced apart from the reflective element for being exposed by the laser beam reflected by the reflective element.

4,841,312

THERMAL-ELECTROSTATIC INK JET RECORDING APPARATUS

Nanao Inoue; Koichi Saito; Ryoki Kato; Hiroshi Fujimagari; Yoshihiko Fujimura; Seiichi Kato; Koichi Naito, and Kiyoshi Horie, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1987, Ser. No. 126,125

Claims priority, application Japan, Nov. 27, 1986, 61-280579

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—160 R **12 Claims**

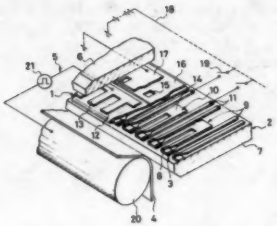
7. An ink jet recording apparatus comprising:

(a) a recording head formed of two spaced apart insulating plates, each having an inner face and providing a slit therebetween for containing an ink to be jetted from said head onto a recording sheet, said head having a discharge side toward the recording sheet from which the ink is to be jetted and a base side opposite said discharge side;

(b) electrostatic field forming electrode means for forming an electrostatic field between ink in said slit and the recording sheet, including a field forming electrode positioned in said slit; and

(c) thermal energy applying means for selectively heating unit areas of the ink in response to image signals to cause ink in said unit areas to be jetted under the influence of the

electrostatic field toward said recording sheet, said thermal energy applying means including a plurality of electric resistance heaters arranged adjacent one another on one of said inner faces adjacent said discharge side, each of said heaters having an independent electrode connectable to a switching circuit for selectively causing an electric current to flow through the heater in response to image signals, wherein said heaters are grouped into a plurality of pairs, each pair comprising two adjacent heaters, each of said heaters having an inner end and an outer end, said



apparatus further including a plurality of U-shaped common electrodes, each of said common electrodes being associated with a different one of said pairs of heaters, each said common electrode having first and second free ends, said first free end being connected to said inner end of one of said heaters in said associated pair and said second free end being connected to said inner end of the other of said heaters of said associated pair, and said independent electrode of each said heater being connected to the outer end of said heater.

4,841,313

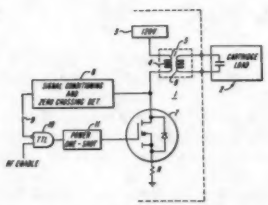
RF DRIVER AND CONTROL

Nathan K. Weiner, Stoughton, Mass., assignor to Delphax Systems, Randolph, Mass.

Filed Jun. 16, 1987, Ser. No. 63,155

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—159 **21 Claims**



1. A drive network for driving a transformer-coupled resonant circuit at its resonant frequency F, said resonant circuit including a transformer having a primary winding and a secondary winding and including a load element coupled across said secondary winding, wherein the inductance of said secondary winding and the capacitance of said load element substantially define said resonant frequency, comprising:

A. current means coupled to said primary winding for establishing a controllable impedance current path from a first potential through said primary winding to a second potential and including means for controlling said impedance of said path in response to an applied trigger signal, and

B. feedback means responsive to the voltage across said primary winding for generating said trigger signal and applying said trigger signal to said impedance control means whereby an oscillatory current is established in said current path at said resonant frequency, said feedback means including:

i. an AC signal means responsive to said voltage across said primary winding to generate an AC signal representative of the AC component of said voltage across said primary winding measured with respect to a reference potential,

ii. a trigger generator means responsive to said AC signal for generating a trigger signal having a succession of voltage pulses substantially in a predetermined phase relation to the oscillatory current and alternate ones of the crossings of said reference potential by said AC signal, and

iii. means for applying said trigger signal to said impedance control means.

4,841,314

ELECTROSTATIC LATENT IMAGE FORMING APPARATUS USING SEMICONDUCTOR LASER

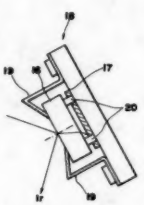
Naoto Ohmori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 9, 1988, Ser. No. 230,467

Claims priority, application Japan, Aug. 12, 1987, 62-201184

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160 **12 Claims**



1. An electrostatic latent image forming apparatus comprising:

a semiconductor laser;

drive means for adding bias current to switching current modulated by an image signal and applying the current obtained by the addition to said semiconductor laser, thereby to excite the semiconductor laser to emit a laser beam;

a photoreceptor having a surface on which an electrostatic latent image is to be formed by the laser beam;

a scanning optical system for scanning the surface of said photoreceptor by the laser beam emitted from said semiconductor laser and forming the electrostatic latent image by the laser beam on the surface of said photoreceptor;

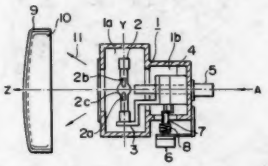
a low reflectance mirror disposed in a path of transmission of the laser beam extending from said semiconductor laser to said photoreceptor for lowering intensity of said laser beam during reflecting the laser beam toward the photoreceptor, the low reflectance mirror having a function which reflects a part of the laser beam and transmits the remaining laser beam; and

light absorbing means disposed behind said low reflectance mirror for absorbing the laser beam passing through the low reflectance mirror.

4,841,315
EXPOSURE APPARATUS

Misao Kokabu; Hitoshi Nakamura; Takashi Fujimura, all of Mobara, and Nobuyasu Hayashi, Chiba, all of Japan, assignors to Hitachi Ltd. and Hitachi Device Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,768
Claims priority, application Japan, Sep. 18, 1987, 62-232256
Int. Cl.[4] G03B *41/00*
U.S. Cl. 354—1 **3 Claims**



1. An exposure apparatus for use in forming a fluorescent screen on the inner surface of the panel of a color cathode ray tube, comprising:

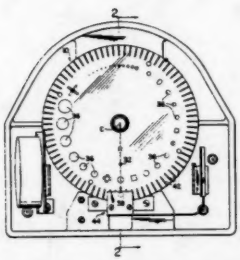
a short-arc mercury-vapor lamp having an approximately spherical bulb charged with mercury vapor in an enclosed manner, an electron-emission electrode, and an opposing electrode disposed in opposition to said electron-emission electrode, said electrodes being spaced apart from each other along the center axis of said bulb by a predetermined distance so that an arc is produced between said electrodes; and

drive means for causing said short-arc mercury-vapor lamp to be displaced toward the center axis of said panel in correspondence with the variation of the arc center of said short-arc mercury-vapor lamp.

4,841,316
PHOTOHEAD SYSTEM FOR POSITIONING AN APERTURE WHEEL AND METHOD OF MAKING AN APERTURE DISC

Robert J. Pavone, South Windsor; Bruce L. Davidson, East Hartford, and Henry F. Berdat, Manchester, all of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Feb. 17, 1988, Ser. No. 157,285
Int. Cl.[4] G03B *41/00*
U.S. Cl. 354—4 **13 Claims**



1. An apparatus for selectively exposing various images on a photosensitive surface, said apparatus comprising:

a frame having a beam axis;

radiant energy emitting means supported by said frame in registry with said beam axis to provide radiant energy for exposing images on a photosensitive surface;

beam imaging means located coincident with said beam axis for forming from said radiant energy emitted by said emitting means a light beam along said beam axis;

aperture means having a plurality of differently sized apertures spaced from one another along a first arcuate path concentric with an axis of rotation,

said aperture means having a plurality of indicators equidistantly spaced from one another in a second arcuate path concentric with said first path, each of said apertures being oriented in radial alignment with one of said indicators;

means supporting said aperture means for rotation relative to said frame about said axis of rotation and with said axis of rotation generally parallel to said beam axis with said arcuate first path intersecting said beam axis,

initializing means fixed relative to said indicators and cooperating with said frame for initializing one of said indicators to a reference position relative to said frame;

drive means supported by said frame and engaging said aperture means for selectively positioning one of said apertures in alignment with said beam axis;

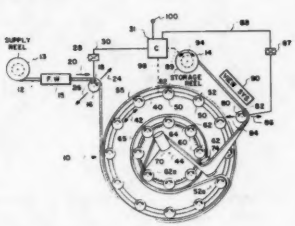
a sensor fixed to said frame and located in alignment with said aperture means second path for generating an indicating signal each time one of said plurality of indicators moves past said sensor; and

control means connected with said sensor and said drive means for receiving said indicating signals from said sensor and establishing from said signals the present position of said aperture means relative to said reference position and for energizing said drive means to rotate said aperture means to position a selected one of said differently sized apertures in precise alignment with said beam axis.

4,841,317
WEB HANDLING DEVICE

William E. Westell, Weston, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 2, 1988, Ser. No. 189,084
Int. Cl.[4] G03B *37/02*; H04N *3/36*; B65H *16/00*
U.S. Cl. 354—65 **16 Claims**



1. Web handling apparatus for use with first and second web storage means, comprising:

a first plurality of rotatable members mounted proximate a first plane and arranged around a first axis, each rotatable member of the first plurality being rotatable about axes substantially perpendicular to the first plane;

a second plurality of rotatable members mounted proximate the first plane and arranged around the first axis and surrounding the first plurality, each rotatable member of the second plurality being rotatable about axes substantially perpendicular to the first plane;

canted means rotatable about an axis at an acute angle with the first plane, the web being wound around the first and second pluralities of rotatable members and the canted means between the first and second web storage means, the windings of web around the first and second pluralities being substantially parallel to the first plane, a predetermined one of the rotatable members of the first plurality operating to direct the web between the first and second pluralities and a predetermined one of the rotatable members of the second plurality operating to direct the web between the second plurality and the canted means so that the web is directed out of parallelity with the first plane between the second plurality and the second storage means; and

control means operable to rotate the second plurality of rotatable members as a group around the first axis.

4,841,318

CAMERA SYSTEM WITH MODE SELECTING DEVICE

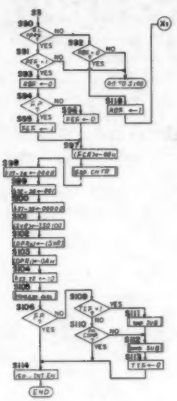
Kouji Yamamoto, Sakai; Shinji Tominaga, Osaka; Akira Yamanaka, Sakai; Hiroshi Ueda, Nara; Nobuyuki Taniguchi, Tondabayashi; Ikushi Nakamura, and Michihiro Iwata, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 797,510, Nov. 13, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 169,586

Claims priority, application Japan, Nov. 14, 1984, 59-173261; Dec. 28, 1984, 59-197143; Feb. 27, 1985, 60-28848; Mar. 8, 1985, 60-33950; Mar. 12, 1985, 60-35962; Mar. 12, 1985, 60-35963; Mar. 27, 1985, 60-45490; Mar. 27, 1985, 60-45491; Mar. 28, 1985, 60-46676; Mar. 28, 1985, 60-46677; Mar. 28, 1985, 60-46678

Int. Cl.[4] G03B *1/00*

U.S. Cl. 354—173.1 5 Claims



1. A control device for use in a camera comprising:

means for winding up a film loaded in the camera by one frame;

means for generating a release signal to effect exposure on the film;

means for choosing first mode or second mode, during the first mode the camera operates to take pictures consecutively so long as the release signal is generated, and during the second mode the camera operates to take only one picture even if the generation of the release signal is continued;

means for preliminary winding up the film by predetermined length in response to a closure of a back lid of the camera, the film lying in the normal frame position when the preliminary winding is terminated; and

means for forcibly selecting the second mode before the preliminary winding is terminated.

4,841,319

APPARATUS FOR LOADING A FILM CASSETTE INTO A CAMERA

David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

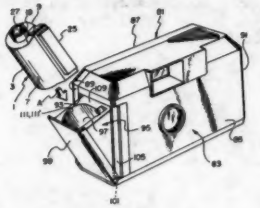
Filed May 9, 1988, Ser. No. 191,445

Int. Cl.[4] G03B *17/02, 17/26*

U.S. Cl. 354—275 10 Claims

1. An improved photographic camera wherein there is provided a film cassette receiving chamber, and wherein the improvement comprises:

said film cassette receiving chamber being configured to receive the type of film cassette that contains a non-protruding film leader, and including a loading opening having a continuous enclosed perimeter substantially commensurate in shape with an outline of the aforementioned film cassette to prevent the type of film cassette that has a protruding film leader from being inserted into said chamber.



4,841,320

DEVELOPING DEVICE FOR PHOTOSENSITIVE MATERIAL

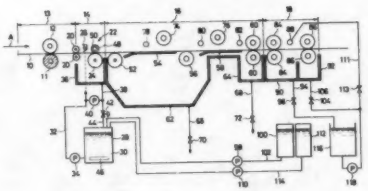
Tomoaki Takekoshi; Hisao Ohba, and Kenji Kunichika, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Dec. 23, 1987, Ser. No. 137,076

Claims priority, application Japan, Dec. 23, 1986, 61-307054

Int. Cl.[4] G03D *5/04*

U.S. Cl. 354—299 9 Claims



1. A device for developing a photosensitive material, comprising: warming means for raising the temperature of said photosensitive material; measuring means for applying only a minimum necessary amount of a developing solution for effecting development to an exposed surface of said photosensitive material; and a developing section for developing said photosensitive material with said developing solution applied by said measuring means and wherein the warmed photosensitive material heats the developing solution which is applied thereon sufficiently to enhance the development of the photosensitive material within said developing section.

4,841,321
CIRCULATING LIQUID FLOW DETECTING APPARATUS IN A MACHINE FOR AUTOMATICALLY PROCESSING LIGHT-SENSITIVE MATERIAL

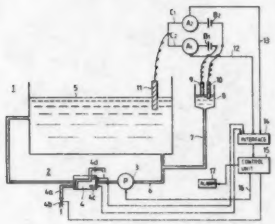
Junichi Kose, and Nobuyuki Seto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 5, 1988, Ser. No. 190,430

Claims priority, application Japan, May 7, 1987, 62-109684; May 7, 1987, 62-109685; Sep. 17, 1987, 62-231111; Sep. 17, 1987, 62-231112

Int. Cl.[4] G03D *3/06*

U.S. Cl. 354—324 **10 Claims**



1. An apparatus for detecting circulating liquid flow in a machine for automatically processing a photographic light-sensitive element, comprising:

a processing tank for containing a processing liquid;

a processing liquid circulating means, provided outside said processing tank, for circulating a part of the processing liquid in said processing tank;

a branch pipe means having an opening portion at one end opened at a position higher than a liquid level of the processing liquid, said branch pipe means being vertically disposed and having the other end connected to a pipe which extends between a lower portion of said processing tank and a suction side of said processing liquid circulating means such that the liquid in said branch pipe means is directly responsive to operation of said circulating means;

a first liquid level detecting electrode provided in said opening portion so that a lower end of said first electrode is positioned on the same level as or a position a little lower than the liquid level of said processing tank;

a second liquid level detecting electrode provided so that a lower end of said second electrode is positioned on the same level as or a little lower than a position where the liquid level in said branch pipe is lowered when said circulating means is driven; and

a common electrode provided so as to be in contact with the processing liquid.

4,841,322
CAMERA HAVING INTERCHANGEABLE LENSES

Masahiro Kawasaki, and Osamu Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 103,311, Oct. 1, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,328

Claims priority, application Japan, Oct. 1, 1986, 61-234141; Nov. 10, 1986, 61-265738; Feb. 6, 1987, 62-15509[U]

Int. Cl.[4] G03B *3/10, 7/20*

U.S. Cl. 354—400 **23 Claims**

1. A camera capable of being used with a plurality of types of interchangeable photographing lens means, comprising:

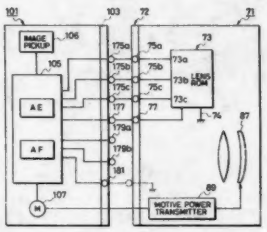
a camera body having a first mount for mounting photographing lens means to said body;

a first electrical contact;

means coupled to said first electrical contact for detecting whether a photographing lens means mounted on said mount has an automatic focusing capability;

a first group of electrical contacts for coupling signals between said photographing lens means and said camera body; and

means for transmitting via said first group of electrical contacts a single datum from said photographing lens means to said camera body in a parallel mode when said



detecting means detects that said lens has no automatic focusing capability and transmitting and receiving a plurality of different data in a series mode when said detecting means detects that said photographing lens means has an automatic focusing capability.

4,841,323
AUTOMATIC FOCUSING METHOD AND CAMERA PROVIDED WITH AUTOMATIC FOCUSING APPARATUS

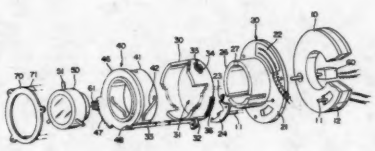
Minoru Yamada; Eiji Ito; Kenji Miyama, all of Hachioji; Masataka Sawamura, Hino; Yasushi Hoshino, Tokyo, and Masamori Makino, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 890,181, Jul. 14, 1986. This application Mar. 9, 1988, Ser. No. 169,102

Claims priority, application Japan, Dec. 4, 1984, 59-184450[U]; Dec. 4, 1984, 59-256870; Dec. 4, 1984, 59-256872; Dec. 5, 1984, 59-258114; Apr. 23, 1985, 60-88322; Apr. 30, 1985, 60-93394

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **10 Claims**



1. An automatic focusing camera comprising:

a distance measuring means for producing a distance information of an object;

a photographic lens;

lens guide means attached to the lens for moving the lens along an optical axis;

a lens-driving means having a groove adapted to receive the lens guide means;

a lens-positioning means arranged adjacent the lens-driving means, said lens-positioning means having a stepped cam for setting the position of stoppage of the lens moved by the lens-driving means; and

means for controlling the rotation of the lens-driving means and the lens-positioning means in accordance with the distance information from the distance measuring means; wherein the lens-driving means and the lens positioning means are rotated relative to each other by the controlling means to focus the lens, whereby both the lens-driving means and the lens-positioning means are simultaneously

rotated then only the lens-driving means is rotated to move the guide means onto the stepped cam of the lens-positioning means along the groove for focusing and thereafter the lens-driving means is stopped at a position based on the distance information.

4,841,324

CAMERA HAVING AN AUTO-FOCUSING DEVICE

Akira Ogasawara, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

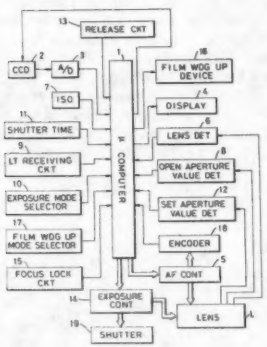
Continuation of Ser. No. 41,628, Apr. 22, 1987, Pat. No. 4,723,139, which is a continuation of Ser. No. 875,688, Jun. 18, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 134,202

Claims priority, application Japan, Jun. 26, 1985, 60-139281; Aug. 23, 1985, 60-185547

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] G03B *3/00, 17/40*

U.S. Cl. 354—402 **6 Claims**



1. a camera body on which a first photographing lens and a second photographing lens are exchangeably mounted, said first photographing lens having an optical system that is driven automatically in accordance with a defocus distance when said first photographing lens is mounted on said camera body, and said second photographing lens having an optical system that is not driven automatically when said second photographing lens is mounted on said camera body, comprising:

detection means for detecting a defocus distance of a photographing lens;

drive means for driving said first photographing lens on the basis of the detected defocus distance;

means for detecting mounting of said second photographing lens on said camera body to generate a lens detection signal; and

control means for controlling said drive means, said control means providing said drive means with an operating period for driving said first photographing lens between an exposure operation and a subsequent exposure operation, but deleting said operating period in response to said detection signal.

4,841,325

AUTOMATIC FOCUSING DEVICE FOR CAMERA

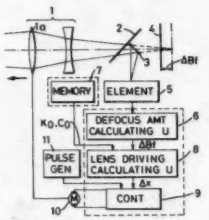
Kunihisa Hoshino, deceased, late of Tokyo (by Chic Hoshino, legal representative); Yoshinari Hamanishi, Tokyo, and Ken Utagawa, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 5,241, Jan. 20, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,967

Claims priority, application Japan, Jan. 22, 1986, 61-12391

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **17 Claims**



1. A camera comprising:

(a) a photographing lens for forming an image of an object, said photographing lens having at least one lens component which is movable to form the image of the object;

(b) detecting means for detecting an amount of defocus of the image of the object formed by said photographing lens from a predetermined plane and for producing a defocus signal which indicates the detected amount of defocus;

(c) memory means in which a conversion coefficient and a correction coefficient are stored fixedly;

(d) motor means for moving said at least one lens component;

(e) calculating means for determining a corrected conversion coefficient on the basis of the conversion coefficient stored in said memory means and both said detected amount of defocus conforming to said defocus signal and said correction coefficient stored in said memory means, and also for conducting a calculation of a driving amount of said motor means on the basis of the corrected conversion coefficient and the detected amount of defocus, said calculating means producing a driving signal which indicates said driving amount of said motor means; and

(f) control means responsive to said driving signal for causing said motor means to drive by said driving amount indicated by said driving signal.

4,841,326

APPARATUS FOR DETECTING THE FOCUS ADJUSTED STATE OF AN OBJECTIVE OPTICAL SYSTEM

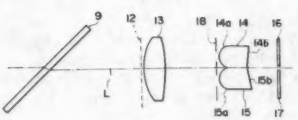
Takeshi Koyama, and Keiji Ohtaka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1987, Ser. No. 115,905

Claims priority, application Japan, Nov. 5, 1986, 61-264355

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—406 **13 Claims**



1. An apparatus for detecting the focus adjusted state of an objective optical system, comprising:

a plurality of pattern forming optical means for forming energy patterns whose relative positional relation varies in conformity with the focus adjusted state by the use of energy passed through different areas of a pupil of the objective optical system;

sensing means having a plurality of portions and producing a signal regarding a relative positional relation between the energy patterns; and

optical means disposed between the objective optical system and said pattern forming optical means for asymmetrically varying optical paths passing through said areas of the pupil;

said pattern forming optical means being arranged in the direction passing through said areas on the pupil and forming an asymmetrical shape with respect to the optic axis of said objective optical system, a first pattern forming optical means having a different shape from a second pattern forming optical means.

4,841,327

CAMERA SYSTEM

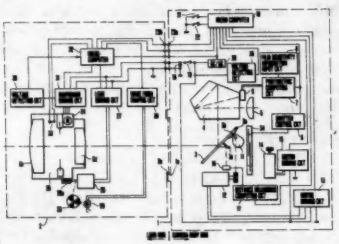
Hiroshi Yamamoto, and Nobuyuki Suzuki, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 141,715

Claims priority, application Japan, Jan. 12, 1987, 62-4590; Jan. 12, 1987, 62-4591; Jan. 19, 1987, 62-9441

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—412 **28 Claims**



1. A camera system having a camera body and an interchangeable lens body which is detachably mountable on said camera body, comprising:

(a) said camera body including:

(a-1) a power source;

(a-2) a first motor arranged to be operated by a power supply from said power source;

(a-3) mirror driving means arranged to be driven by said first motor to move a mirror both upward and downward according to the operation of said first motor; and

(a-4) means for effecting a power supply to said interchangeable lens body;

(b) said interchangeable lens body including:

(b-1) a second motor arranged to be operated by a power supply from said power source;

(b-2) diaphragm driving means arranged to be driven by said second motor and to drive a diaphragm both in the directions of stopping down and opening the aperture thereof according to the operation of said second motor; and

(b-3) means for receiving said power supply from said camera body; and

(c) control means for controlling the operations of said first and second motors, said control means being arranged to actuate said first motor to cause said mirror driving means to move said mirror upward, to actuate said second motor to cause said diaphragm driving means to drive said diaphragm in the direction of stopping down the aperture thereof after the lapse of a given period of time from commencement of the upward movement of said mirror, to actuate said first motor to cause said mirror driving means to move said mirror downward and to actuate said second motor to cause said diaphragm driving means to drive said diaphragm in the direction of opening the aperture thereof after the lapse of a given period of time from the end of the downward movement of said mirror.

4,841,328

ELECTROSTATIC RECORDING APPARATUS

Masaru Takeuchi; Takeo Fukatsu, both of Kyoto; Shoichi Nakano, Osaka; Yukinori Kuwano, Osaka; Koji Minami, Osaka, and Masayuki Iwamoto, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 893,099

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—211 **33 Claims**

1. An electrostatic recording apparatus comprising:

a photosensitive member which includes a support and a bulk layer composed of an amorphorous material which is formed on the support, wherein a first layer region is formed at the support side in the bulk layer, a second layer region is formed at the surface side therein, said first layer region containing silicon atoms as base material and hydrogen of 0.01-40 atomic %, oxygen, carbon or nitrogen of 0.01-40 atomic % and an element in the group III or V of the periodic table of 5×10^{-6}-1.0 atomic %, and said second layer region containing silicon atoms as base material and hydrogen of 0.01-40 atomic % and not being doped virtually with an element in the group III or V of the periodic table,

charging means for uniformly charging said photosensitive member,

a first light source mounted for exposure to said photosensitive member to form an image after charging said photosensitive member by said charging means, and

a second light source mounted for discharging said photosensitive member to eliminate charges remaining on said photosensitive member immediately before charging said photosensitive member by said charging means,

the wavelengths of light from said first and second light sources being shorter than 650 nm, respectively.

4,841,329

DEVELOPING DEVICE ACCOMMODATING APPARATUS AND IMAGE FORMING APPARATUS AND DEVELOPING DEVICE

Toshirou Kasamura, Yokohama; Masafumi Takagi; Naoki Okuda, both of Kawasaki; Masashi Ohashi; Toshihiko Kusumoto, both of Tokyo; Nobukazu Sasaki, Yokohama; Yasunori Maeda, Inagi, and Masamichi Ikeda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 116,957

Claims priority, application Japan, Nov. 7, 1986, 61-265096; Nov. 18, 1986, 61-274584; Dec. 26, 1986, 61-313178; Mar. 10, 1987, 62-52915; Mar. 10, 1987, 62-52927

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—245 **31 Claims**

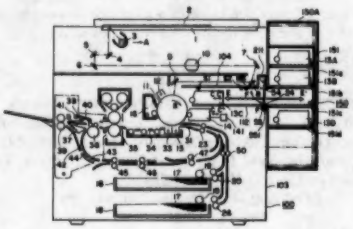
1. An image forming apparatus, comprising:

accommodating means for accomodating a plurality of developing devices on movable stages and having first moving means for moving the developing devices in a predetermined direction intersecting a direction of movement of the stages; and

an image formation assembly including a second moving means for receiving a said developing device moved out of said accommodating means and for further moving it in the predetermined direction, said image formation assembly including means for forming images using said developing device;

said accommodating means further including means for allowing a said developing device to be loaded into said

accommodating means, said allowing means allowing said accommodating means to be hinged to expose such side of



said accommodating means as is opposed to said moving means, thus allowing the loading of the developing device.

4,841,330

RECORDING APPARATUS

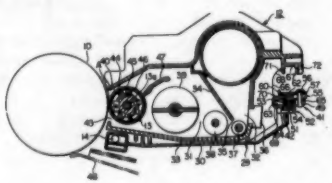
Susumu Owada; Masayuki Kamegamori, both of Hachioji, and Akira Kosugi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,209

Claims priority, application Japan, Mar. 8, 1986, 61-50982; Mar. 8, 1986, 61-50984; Mar. 8, 1986, 61-33504[U]; Mar. 11, 1986, 61-51312

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—245 **12 Claims**



1. A recording apparatus comprising:

an image carrier having a movable image surface adapted for carrying a latent image to be developed, said image carrier including a drum extending in a longitudinal direction;

a developing unit having a developer surface for conveying a developer thereon,

guide means including a wall for slidably mounting said developing unit thereon,

means for releasably biasing said developing unit for slidably moving said developing unit in a biasing direction between at least a first position and a second position, said first position being an operating position where said developer surface faces said movable image surface with a development gap therebetween to transfer the developer onto the movable image surface and the second position is a detached position where said developer surface is spaced from said movable image surface with a gap larger than the development gap, said developing unit including an end wall part overlapping a portion of said image carrier when said developing unit is in said operating position to prevent movement of said developing unit in said longitudinal direction; and

said guide means further allowing said developing unit to slide on said wall in a mounting direction transverse to the biasing direction, said developing unit being slidable on said guide means in said mounting direction for mounting said developing unit in the recording apparatus and then movable in said biasing direction for positioning in said operating position.

4,841,331

TRIBOELECTRIC CHARGE APPLICATION MEMBER FOR TONER

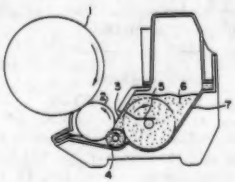
Nobuhiro Nakayama, Susono; Yasuo Asahina, Numazu; Hiroyuki Fushimi, Numazu, and Yasuaki Iwamoto, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,694

Claims priority, application Japan, Mar. 5, 1987, 62-51011

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—245 **11 Claims**



1. A development apparatus for developing latent electrostatic image by toner to visible toner images, comprising a triboelectric charge application member for triboelectrically charging a toner, which serves as a member for regulating the thickness of a toner layer formed on a rotatable developer feeding member, which triboelectric charge application member comprises a base substrate member and an overcoat layer formed on said base substrate, which overcoat layer comprises as the main component a polymer prepared from at least a fluoro-olefin compound and an unsaturated silicon compound as monomer compounds for said polymer.

4,841,332

TONER CONTROL FOR A DEVELOPER DEVICE

Satoshi Haneda; Hisashi Shoji, and Seiichiro Hiratsuka, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

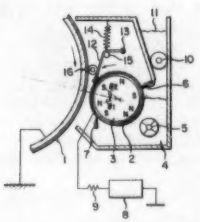
Continuation-in-part of Ser. No. 810,990, Dec. 19, 1985, abandoned, which is a continuation of Ser. No. 703,286, Feb. 20, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 890,787

Claims priority, application Japan, Feb. 23, 1984, 59-31405

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.[4] G03G *15/08, 15/09*

U.S. Cl. 355—251 **26 Claims**



1. A developing means for developing, in an oscillatory electric field, a latent image formed on an image forming member comprising a two-component type developer wherein a mixture of toners and magnetic carriers is used, a developing sleeve having fixed magnetic poles therein, said developing sleeve being provided to face with said image forming mem-

ber, said developer being arranged to move on said developing sleeve according to the rotation of said sleeve, said magnetic poles being arrangeed so as not to be in the nearest position to said image forming member, and said magnetic carriers having a resistivity of not less than 10^{13} Ωcm measured by reading an electric current value obtained in the manner that the carrier particles are put in a vessel having a sectional area of 0.5 cm^2 and tapped, and a load of 1 kg/cm^2 is applied onto the packed particles and a voltage is applied between the load and a bottom electrode so as to generate an electric field of 1000 V/cm.

4,841,333

PROCESS UNIT FOR AN IMAGING APPARATUS

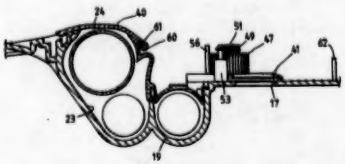
Dhirendra Damji, Biggleswade, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 10, 1988, Ser. No. 204,827

Claims priority, application United Kingdom, Aug. 19, 1987, 8719545

Int. Cl.[4] G03G *5/00, 15/08*

U.S. Cl. 355—211 **16 Claims**



1. A process unit adapted to be removably mounted in a main assembly of an electrostatographic printing machine, comprising a housing , an imaging member inside the housing, which housing has a chamber for containing developer and an aperture through which the imaging member may be exposed to light, an opaque shutter adjacent the aperture, and a sealing shutter adjacent the developer chamber, wherein the opaque shutter and the sealing shutter are linked to form a unitary member which is slideably mounted within the housing and which is adapted to cooperate with actuating means provided on the main assembly of the printer whereby the opaque shutter and the sealing shutter are moved together to positions at which they respectively close the aperture and seal the developer chamber when the process unit is removed from the main assembly, and the opaque shutter and the sealing shutter are moved together to positions at which the aperture and the developer chamber respectively are open when the process unit is inserted in the main assembly of the copying machine.

4,841,334

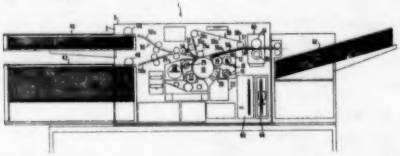
ELECTROGRAPHIC PRINTER WITH SMALL DIAMETER DRUM AND CHARGED TRANSFER BELT

Kensuke Fukae, Monsey, N.Y., and Shozo Kaieda, Nagano, Japan, assignors to Kentek Information Systems, Inc., Allendale, N.J.

Filed Jul. 28, 1987, Ser. No. 78,861

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—271 **41 Claims**



1. An electrographic printing apparatus for producing hard copies of information to be recorded on a sheep of paper or the like, comprising,

a housing,

a source of paper and an output receptacle for receiving said paper after it is imprinted,

a paper path along which said paper travels between said source and said output receptacle,

a photoconductive member for storing a latent electrostatic image of the information to be imprinted,

developer means for developing said latent electrostatic image on said photoconductive member, and

combined transfer and transport means associated with said photoconductive member, said combined transfer and transport means being located above said paper path and transporting said paper from above, said combined transfer and transport means cooperating with said photoconductive member to define a transfer zone wherein said developed image is transferred to said paper, said combined transfer and transport means being operative to separate said paper from said photoconductive member and to transport said paper along said paper path away from said photoconductive member.

4,841,335

RECORDING APPARATUS AND METHOD

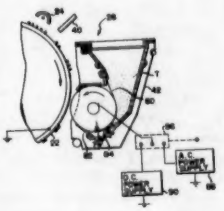
Mitsuaki Kohyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

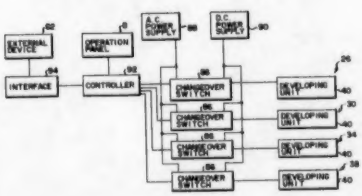
Filed Dec. 4, 1986, Ser. No. 937,977

Claims priority, application Japan, Dec. 5, 1985, 60-272482

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—245 **16 Claims**





1. A recording apparatus for recording a color image or a monochromatic image of a color selected from a plurality of colors on a recording member with a plurality of developing agents, comprising:

selecting means for selecting color image recording mode or a monochromatic image recording mode and selecting the color at monochromatic image recording time;

an image carrier;

charging means for charging the carrier;

a plurality of latent image forming and developing means provided along a moving direction of said carrier, said plurality composed of a first latent image forming and developing means and subsequent latent image forming and developing means, for using the developing agents of

the plurality of colors, the latent image forming and developing means respectively having:

latent image forming means for forming a latent image on the carrier charged by the charging means,

developing means for developing the latent image formed by the latent image forming means with the developing agents,

said plurality of latent image forming and developing means alternately repeat the formation of the latent image on the carrier charged by the charging means and the development of the latent image at color image recording mode time to form a color developing agent image;

said latent image forming and developing means of the color selected by the selecting means forms the latent image on the carrier charged by the charging means, and develops the latent image at monochromatic image recording mode time to form a monochromatic developing agent image,

said subsequent developing means developing the latent images without contact with the carrier,

transfer means for transferring the color developing agent image or monochromatic developing agent image formed by the latent image forming and developing means on the recording member, and

bias electric field applying means for applying a first bias electric field between the carrier and the subsequent developing means, said bias electric field applying means applying the bias electric field for moving the developing agent flown from the developing means by electrostatic force to move only in a direction toward the carrier at color image recording mode time and applying a second bias electric field having a sufficient intensity and frequency to cause the developing agent flown from the developing means to reciprocate at monochromatic image recording mode time.

4,841,336

IMAGE FORMING APPARATUS WITH DEVELOPING DEVICE ACCOMMODATING MEANS

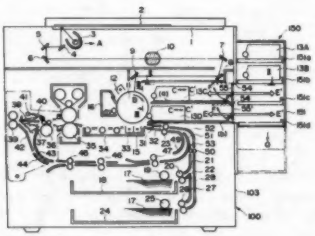
Toshihiko Kusumoto, Tokyo; Toshirou Kasamura, Yokohama; Naoki Okuda, Kawasaki; Masashi Ohashi, Tokyo; Nobukazu Sasaki, Yokohama, and Minoru Nada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,934

Claims priority, application Japan, Mar. 10, 1987, 62-52901; Mar. 10, 1987, 62-52913; Mar. 10, 1987, 62-52924

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—245 **7 Claims**



1. A multi-color image forming apparatus, for forming a superimposed multi-color image on a transfer material, comprising:

a latent image bearing member;

means for forming a latent image on said image bearing member;

plural developing means containing different color developers for developing the latent image in different colors;

means for accommodating said plural developing means;

guiding means for guiding said developing means between a first position within said accommodating means and a second position adjacent said image bearing member;

driving means for moving said developing means between the first position and the second position for exchange of the developing means at the second position;

means for discriminating said plural developing means;

second developing means disposed adjacent said image bearing member at a different position;

wherein when plural colors are selected for development, a discrimination is made as to whether the developing means containing the developer of the selected color is at the second position or not, and if so, the developing means located at the second position is operated before the other of the plural developing means irrespective of the order of the selection.

4,841,337

IMAGE FORMING APPARATUS

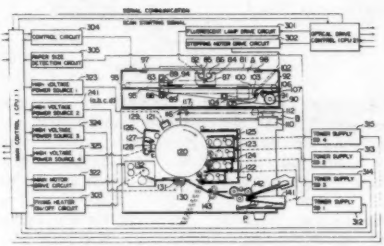
Seiichiro Hiratsuka; Kunihisa Yoshino; Satoshi Haneda, and Hisashi Shoji, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,711

Claims priority, application Japan, Apr. 21, 1987, 62-99534

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—157 **10 Claims**



1. A color image forming apparatus comprising color separation means for obtaining a color-separated image of a specific color, changeover means for changing a color component to be separated by said color separating means, a single photoelectric converting means for converting said color-separated image into an electric signal, a single signal processing means for forming image data by processing an output signal of said photo-electric converting means, latent image forming for forming a latent image on an image retainer based on said image data, and a plurality of developing means having therein toners each different in color for developing said latent image, wherein a step for forming a toner image on said image retainer is repeated plural times by selecting one of said plural developing means corresponding to a specific color by said changeover means, so that a multi-color toner image is formed on said image retainer.

4,841,338

IMAGE RECORDING AND ADHERING APPARATUS

Keiko Suzuki, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 25, 1988, Ser. No. 173,609

Claims priority, application Japan, Mar. 27, 1987, 62-75664; Sep. 22, 1987, 62-238453

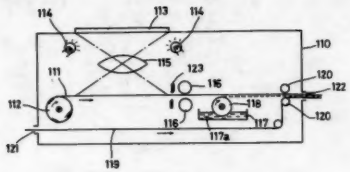
Int. Cl.[4] G03B *27/32, 27/52;* G03C *1/72*

U.S. Cl. 355—27 **12 Claims**

1. An image recording and adhering apparatus including:

an exposing means for image-wise exposing a pressure-sensitive photosensitive medium according to source image information so as to form thereon latent images and a developing means for applying a pressure to the image-

wise exposed photosensitive medium so as to cause a chemical reaction with a developer material to thereby develop said latent images into visible images on a recording medium, wherein the improvement comprises:



an adhering means for adhering a sheet of other medium on the reverse surface of said recording medium.

4,841,339

IMAGE FORMING METHOD

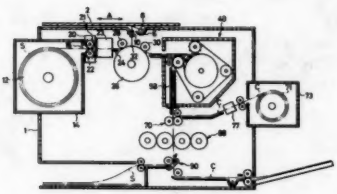
Isao Taniguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1988, Ser. No. 167,285

Claims priority, application Japan, Mar. 12, 1987, 62-55243; Mar. 12, 1987, 62-55244

Int. Cl.[4] G03B *27/32, 27/52;* **B65H** *20/24*

U.S. Cl. 355—27 **9 Claims**



1. An image forming method in which an entrance-side nip roller and an exit-side nip roller, disposed in contact with exposed material supporting means on opposite sides of an exposure position, are employed to convey photosensitive and pressure-sensitive material from a supply position to said exposure position, the improvement comprising operating said entrance-side and exit-side nip rollers with a differential timing so as to remove any sag in said photosensitive and pressure-sensitive material.

4,841,340

METHOD OF AN APPARATUS FOR PRODUCING ADDITIONAL PRINT

Kanji Tokuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1987, Ser. No. 140,181

Claims priority, application Japan, Feb. 9, 1987, 62-27815; Feb. 9, 1987, 62-27816; Feb. 9, 1987, 62-27817

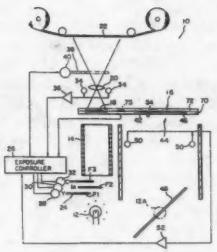
Int. Cl.[4] G03B *27/80*

U.S. Cl. 355—38 **20 Claims**

1. A method of producing an additional print from a negative film by a printer whose internal conditions are preset, wherein said additional print has the same color characteristics of an image on a first printed sheet, said method comprising the steps of:

(a) performing arithmetic operations upon the amount of exposure required for printing an image on photographic paper from said negative film of an original image on the basis of a first set of data of said original image on said negative film and a second set of data of said image on said first printed sheet of photographic paper printed from said negative film; and

(b) performing exposure control on the basis of the results of said arithmetic operations to finish the color characteristics of said image to be additionally printed on said photo-



graphic paper so that said color characteristics become substantially same as the color characteristics of said image printed on said first printed sheet,

wherein said step (a) includes the steps of (c) detecting said first set of data and (d) detecting said second set of data.

4,841,341

INTEGRATOR FOR AN EXPOSURE APPARATUS OR THE LIKE

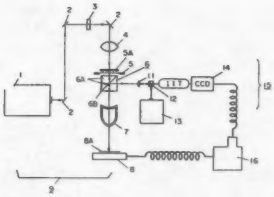
Kazufumi Ogawa; Masaru Sasago, both of Hirakata; Masayuki Endo, Izumi, and Ken Ishihara, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 12, 1987, Ser. No. 61,266

Claims priority, application Japan, Jun. 13, 1986, 61-138555; Jun. 27, 1986, 61-152454

Int. Cl.[4] G03B *27/70, 27/72*

U.S. Cl. 355—43 **14 Claims**



1. An exposure apparatus comprising:

an excimer light source for emitting excimer laser light, the light travelling along an optical path;

a reduction-projection lens disposed in said optical path and through which the light passes;

a wafer stage for holding a wafer in the optical path so as to be exposed to the light travelling therealong;

a mask holder disposed between said light source and said wafer stage for holding a mask to mask the light to which a wafer held by said wafer stage is exposed; and

an integrator disposed in said optical path between said light source and said wafer stage for distributing the light emitted from said light source over a predetermined area with uniform illuminance,

said integrator including a transparent substrate having two opposing surfaces, at least one of said surfaces being a light distributing surface for distributing light passing therethrough,

the entire said light distributing surface consisting of a plurality of concentric recesses.

4,841,342

APPARATUS FOR TREATING PHOTORESISTS

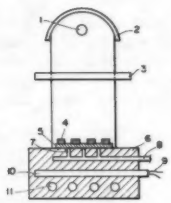
Shinji Suzuki, Kawasaki; Tetsuji Arai, Yokohama; Kuniharu Ohno, Miyashiro; Kazuyeshi Ueki, Kawasaki; Yoshiki Mimura; Kazuya Tanaka, both of Yokohama; Shinji Sugioka, Kakogawa, and Hiroko Suzuki, Kawasaki, all of Japan, assignors to Ushio Denki, Tokyo, Japan

Division of Ser. No. 923,553, Oct. 17, 1986. This application May 12, 1988, Ser. No. 192,994

Claims priority, application Japan, Mar. 13, 1986, 61-53626

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—71 **7 Claims**



1. Apparatus for treating a photoresist pattern on a semiconductor wafer to enhance thermal stability of said pattern comprising:

a support,

means for holding a semiconductor wafer on said support,

a discharge lamp for radiating energy of wavelengths in the ultraviolet range,

means for directing said radiant energy of ultraviolet wavelengths from said discharge lamp to a photoresist pattern formed on a semiconductor wafer supported on said support, and

means interposed between said discharge lamp and said photoresist pattern for selectively filtering wavelengths in the 300 nm to 500 nm spectral response region of said photoresist pattern from said radiant energy, such that treating of said photoresist pattern is accomplished only by ultraviolet radiation components other than wavelengths in said spectral response region.

4,841,343

DRY FILM DEVELOPMENT PROCESS FOR AN APERTURE CARD PRINTER

Michael H. Ranger, San Jose; Esther H. Lim, Fremont, and Robert J. Grady, Redwood City, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,214

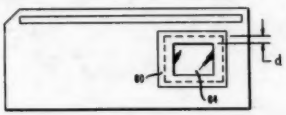
Int. Cl.[4] G03B *27/32*

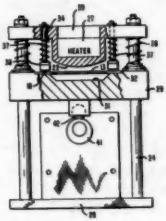
U.S. Cl. 355—77 **6 Claims**

1. In a process for exposing and developing a dry film and which includes:

the steps of exposing the film to a selected light pattern, then stretching the film across a curved heated surface for developing the resultant image using a standard development temperature,

the steps of applying a mask to the peripheral border of the film to decrease exposure of the border and, after exposure, developing the film at a selected development temperature, the selected development temperature being





sufficiently above the standard development temperature to provide a development time which is shorter than the development time associated with the standard development temperature, and

the decrease in development time being proportionately greater than the increase in development temperature, for substantially eliminating image smearing.

4,841,344

LIGHT-EMITTING-DIODE (LED) WITH SPHERICAL LENS

Jochen Heinen, Haar, Fed. Rep. of Germany, assignor to Siemens Atiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 906,900, Sep. 15, 1986, Pat. No. 4,740,259. This application Dec. 7, 1987, Ser. No. 129,178

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532821

Int. Cl.[4] H01L *33/0, 29/06*

U.S. Cl. 357—17 **6 Claims**

1. A light-emitting diode apparatus, comprising:

spherical lens means for radiation concentration secured to a light-emitting diode by means of adhesive;

said light-emitting diode having a semiconductor body with a luminescent zone which has a shape of a spot;

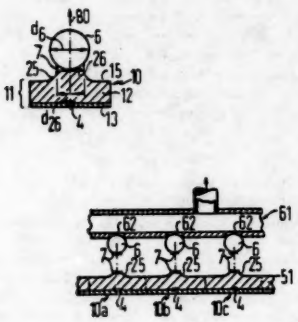
the luminescent zone being situated closer to one surface of said semiconductor body than an opposite surface thereof;

the opposite surface having a mesa with a circular mesa surface, the circular mesa surface being positioned in adjusted and centered fashion opposite the luminescent zone of the diode;

the spherical lens means being arranged on the circular mesa surface, and being aligned and retained in self-centered fashion on the mesa surface by the adhesive;

a diameter of the circular mesa surface being dimensioned of

a comparable size to a diameter of such that the spherical lens is self-centered by a surface tension of the adhesive



when viscous in combination with the mesa surface diameter.

4,841,345

MODIFIED CONDUCTIVITY MODULATED MOSFET

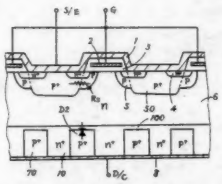
Gourab Majumdar, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Itami, Japan

Filed Aug. 26, 1986, Ser. No. 900,443

Claims priority, application Japan, Aug. 27, 1985, 60-190734; Aug. 27, 1985, 60-190735

Int. Cl.[4] H01L *29/78, 29/74, 27/02*

U.S. Cl. 357—23.4 **3 Claims**



1. A semiconductor device having improved speed and frequency switching characteristics, comprising:

a first drain/collector layer of a first semiconductor conductivity type having a high impurity concentration, said layer having upper and lower major surfaces;

a drift layer of the first semiconductor conductivity type formed on said upper major surface of said first semiconductor layer;

base region of a second semiconductor conductivity type formed in an island shape in predetermined regions on an upper surface of said drift layer;

a source/emitter island region of the first semiconductor conductivity type having a high impurity concentration and formed in an island shape in predetermined regions of an upper surface of said base regions; and

a control electrode formed through an insulating film in a predetermined region on said upper surface of said drift layer and on an upper surface of said base regions;

a second drain/collector region of the second semiconductor conductivity type having a high impurity concentration and formed in an island shape on said lower major surface of said first drain/collector semiconductor layer and in alignment with said source/emitter island region.

4,841,346

FIELD-EFFECT TRANSISTOR DEVICES

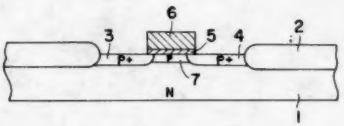
Tatsuo Noguchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,627

Claims priority, application Japan, Mar. 22, 1986, 61-64406

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.1 **2 Claims**



1. In an insulated gate semiconductor device comprising a semiconductor substrate having a first conductivity, a source electrode and a drain electrode having a second conductivity and formed on the substrate, a buried channel having said first conductivity and formed between the source electrode and the drain electrode, and a gate electrode formed above the channel through the intermediary of an insulation layer,

the improvement wherein said gate electrode is made of material having a Fermi level located between a conduction band and a valence band of the semiconductor, and

wherein the substrate has an impurity concentration of more than 1×10^{17} cm^{-3}.

4,841,347

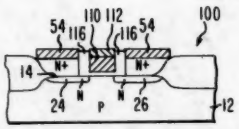
MOS VLSI DEVICE HAVING SHALLOW JUNCTIONS AND METHOD OF MAKING SAME

Sheng T. Hsu, West Windsor Township, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,789

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.9 **9 Claims**



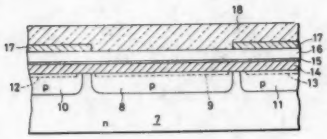
1. An MOS field effect transistor (FET) comprising a body with a surface, an insulated gate on said surface, source and drain regions in said body adjacent said gate extending downwardly from said surface to a predetermined depth and spaced to define a channel region therebetween, two spaced apart layers of doped single cryatalline silicon, one of which is on said surface of said source region in ohmic contact therewith and spaced from said gate and the other of which is on said surface of said drain region in ohmic contact therewith and spaced from said gate, and a layer of refractory metal silicide on said layer of single crystalline silicon, said two layers of doped single crystalline silicon being more highly doped than both of said source and drain regions.

4,841,348

SOLID STATE IMAGE PICKUP DEVICE

Makoto Shizukuishi, and Ryuji Kondo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1987, Ser. No. 71,684
Claims priority, application Japan, Jul. 9, 1986, 61-159543
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **11 Claims**



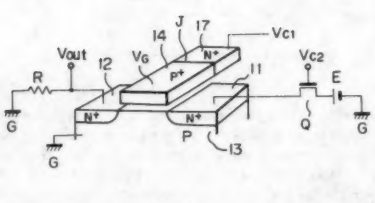
1. A solid state pickup device, comprising:
a semiconductor substrate of a first conductivity type;
a photosensitive section comprising:
a region of a second conductivity type formed in said semiconductor substrate, said region having semiconductive channels of the first conductivity type located at a surface of said region, and having a plurality of charge accumulation means corresponding to respective picture elements;
means for transferring signals accumulated in said charge accumulation means;
a logic circuit integrally formed with said region in said substrate and at a periphery of said region; and
a photoconductive film formed on, and contiguous with, said substrate including said region and said logic circuit, and means for electrically coupling said photoconductive film to each of said plurality of charge accumulation means, and for supplying thereto an electric signal produced in response to light incident on said photoconductive film.

4,841,349

SEMICONDUCTOR PHOTODETECTOR DEVICE WITH LIGHT RESPONSIVE PN JUNCTION GATE

Motoo Nakano, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 798,187, Nov. 14, 1985, abandoned. This application Oct. 28, 1987, Ser. No. 113,324
Claims priority, application Japan, Nov. 16, 1984, 59-241978
Int. Cl.[4] H01L *27/14, 31/10;* H03K *3/42*
U.S. Cl. 357—30 **12 Claims**



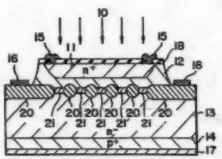
1. A semiconductor photodetector device for a solid state image sensing device, comprising:
an insulating gate field effect transistor having a channel region and source and drain regions of a first conductivity type, a gate electrode of a second conductivity type, opposite to the first conductivity type, and a gate extension portion of the first conductivity type, said gate electrode and said gate extension portion forming a PN junction outside the channel region of said transistor and inside a photodetector area for detecting light; and
means for applying a first voltage to said gate extension portion to reverse bias the PN junction and enable detection of light when the PN junction becomes temporarily conductive and supplies a voltage to said gate electrode, the voltage having a level determined by the intensity of the light of the photodetector area, and for applying a second voltage to said gate extension portion to forward bias the PN junction, reset said photodetector device and release carriers stored in said gate electrode.

4,841,350

STATIC INDUCTION PHOTOTHYRISTOR HAVING A NON-HOMOGENEOUSLY DOPED GATE

Jun-ichi Nishizawa, 6,16, Komegafukuro, 1-chome, Sendai-shi, Miyagi 980, Japan

Continuation of Ser. No. 910,268, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 610,299, Apr. 30, 1984, abandoned. This application Dec. 9, 1987, Ser. No. 131,347
Claims priority, application Japan, Aug. 30, 1982, 57-150300
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **14 Claims**



1. A static induction type photothyristor having a non-homogeneously impurity doped gate structure, which comprises a cathode region of one conductivity type, a gate region and an anode region formed in a high resistivity semi-conductor substrate, the cathode and gate regions being connected at a first junction and the anode and gate regions being connected at a second junction, characterised in that the distribution profile of the impurity in the gate region is non-homogeneous in a gate plane perpendicular to a current flow direction between the cathode region and anode region and includes high impurity concentration region portions, and, with respect to said high impurity concentration region portions, low impurity concentration region portions, the impurity concentrations of said low impurity concentration region portions are sufficiently low to be completely depleted by a built-in potential between said low and high impurity region portions, no neutral region being formed in the low impurity concentration region portions of the gate region, whereby optically excited minority carriers are stored in the high impurity concentration region portions and majority carriers are permitted to easily pass through the low impurity concentration region portions of the gate region, and in that the high and low impurity concentration regions of said gate region are constructed so that their potential voltages relative to said cathode region are capacitively-coupled together so that the potential voltage of the low impurity concentration region portions of the gate region capacitively vary with that of the high impurity concentration regions of the gate region, and said cathode region is formed on a first surface of said semi-conductor substrate and said anode region is formed on another surface reverse from said first surface of said semi-conductor substrate, a cathode electrode is formed on said anode region, and an optical window area is formed on said cathod electrode to permit the penetration of triggering light, a gate electrode being formed on peripheral high impurity concentration region portions of the gate region, and the conductivity type of said gate region portions is the same as that of said anode region and is reverse from that of said cathode region, concentrations of said high

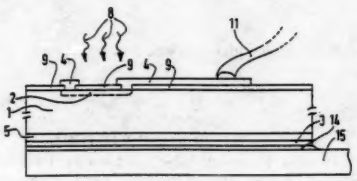
impurity concentration region portions of the gate region are at least one order of magnitude higher than that of said low impurity concentration region portions.

4,841,351

HGCDTE PHOTODIODE WITH HIGH SPEED RESPONSE

Royer Michel, Paris, France, assignor to S.A.T. (Société Anonyme de Télécommunications), France

Filed Apr. 13, 1988, Ser. No. 181,023
Claims priority, application France, Apr. 14, 1987, 87 05256
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **9 Claims**



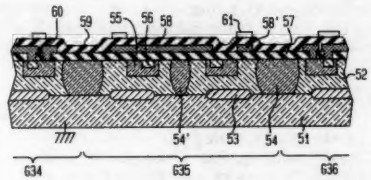
1. A phototdiode made from a P type HgCdTe semiconductor substrate in which an N type doped zone is formed on one face thus providing a PN junction, and with metallizations for access to the P and N zones, wherein the metallization giving access to the P zone is in contact with a degenerated Cu_2Te layer disposed on the P face of said HgCdTe semiconductor substrate opposite the PN junction.

4,841,352

SEMI-CUSTOM INTEGRATED CIRCUIT PROVIDED WITH STANDARDIZED CAPACITOR CELLS

Akira Aso, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 929,769, Nov. 13, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 206,996
Claims priority, application Japan, Nov. 13, 1985, 60-255254
Int. Cl.[4] H01L *27/10, 27/02, 29/72*
U.S. Cl. 357—45 **7 Claims**



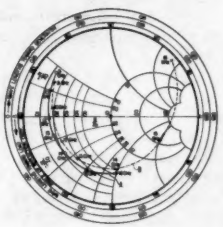
1. A semiconductor integrated circuit comprising:
a semiconductor substrate,
a plurality of circuit elements including bipolar transistors formed in said semiconductor substrate and aligned in a plural number of lines,
a first insulating film covering said semiconductor substrate at said lines and at portions between said lines, a plurality of contact holes being formed in said first insulating film for a selected group of bipolar transistors in said lines, said first insulating film having no contact holes on an unselected group of bipolar transistors ins aid lines, and
a first level of metallic layers disposed on said first insulating film, a first group of said metallic layers running between said lines as at least a part of wirings for interconnection, a second group of said metallic layers being formed on said selected group of bipolar transistors at said lines and being connected to said selected group of bipolar transistors through said contact holes, and a third group of said metallic layers having an enlarged area located on but isolated from said unselected group of bipolar transistors via said first insulating film to form a capacitor in which said enlarged area serves as an upper electrode and said semiconductor substrate with the unselected group of bipolar transistors formed therein serves as a lower electrode without having direct connection to said first level of metallic layers.

4,841,353

TRANSISTOR DEVICES FOR MICROWAVE OSCILLATOR ELEMENTS

Kenzo Wada, and Eiji Nagata, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 753,092, Jul. 9, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 129,390
Claims priority, application Japan, Jul. 10, 1984, 59-141375
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 **8 Claims**

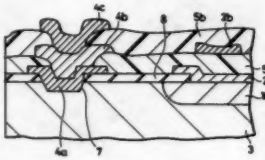


1. In a transistor device for use in oscillating an electric signal at a frequency comprising a transistor chip having three electrodes and a package having three terminals corresponding to the three electrodes, said transistor chip being encapsulated within said package, a control electrode of the three electrodes of said transistor chip being connected to a first of the three terminals by a bonding wire within said package, an output electrode of the three electrodes being coupled with a second of three terminals, the transistor device having an input impedance reviewed from the first terminal as an input terminal at said frequency, the improvement which comprises an insulator plate means fixedly mounted adjacent said transistor chip within said package, and a conductor element supported on said insulator plate means and having opposite ends which are connected to said output electrode and said second terminal of said package, respectively, to connect said output electrode and said second terminal, said conductor element having substantially higher inductance in comparison with that of the bonding wire connected between said control electrode and said first terminal so that said input impedance of said transistor device has a negative resistance characteristic with a reduced phase rotation at said frequency which has no relation to an external circuit connected to said second terminal of the package.

4,841,354
ELECTRONIC DEVICE WITH PERIPHERAL PROTECTIVE ELECTRODE

Tohru Inaba, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 921,525, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 535,234, Sep. 23, 1983, abandoned. This application Apr. 28, 1988, Ser. No. 188,080
Claims priority, application Japan, Sep. 24, 1982, 57-16439
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—71 15 Claims



1. A semiconductor device encapsulated with a resin comprising:

a substrate;

a plurality of semiconductor regions formed in one major surface of said substrate for providing semiconductor elements;

a first film comprised of an inorganic insulating material extending over said substrate;

a first wiring layer formed over said first film and coupled to one of said semiconductor regions through an opening provided in said first film;

a second film comprised of an organic insulating material, said second film being provided over said first wiring layer in said first film; and

stress absorbing means for preventing deformation of said first wiring layer and said second film being formed adjacent to a peripheral portion of said substrate to absorb stress caused during curing of said resin, said stress absorbing means comprising a protective electrode which is made up of lower and upper metal wiring layers comprising aluminum, one superimposed above the other, and which penetrates said first and second films to connect said upper metal wiring layer to said lower metal wiring layer and said lower metal wiring layer to said substrate; said protective electrode being located outside of said semiconductor regions and away form said first wiring layer.

4,841,355
THREE-DIMENSIONAL MICROELECTRONIC PACKAGE FOR SEMICONDUCTOR CHIPS

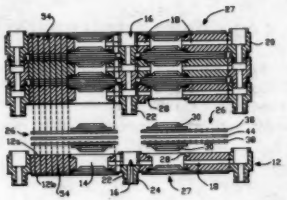
Howard L. Parks, Los Gatos, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Feb. 10, 1988, Ser. No. 154,852
Int. Cl.[4] H01L *23/46, 23/36*
U.S. Cl. 357—82 27 Claims

1. A three-dimensional microelectronic package for semiconductor chips, comprising:

a plurality of cavity wafers, each cavity wafer having a plurality of cavities, tunnels for providing private coolant to said cavities, and conductive paths, said cavity wafers being arranged in a stack;

a plurality of interconnect means, attached to said cavity wafers at positions corresponding to the positions of the cavities, for housing the semiconductor chips, electrically interconnecting the semiconductor chips and said conductive paths of said cavity wafers, selectively electrically interconnecting said conductive paths of adjacent cavity wafers, and for providing a medium for exchanging heat

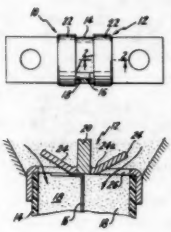


between the semiconductor chips and the coolant in the cavities.

4,841,356
FUSES AND THEIR MANUFACTURE

Kenneth D. Howton, Palatine; Robert G. Stewart, Lake Villa, and Herman R. Zeitler, Mount Prospect, all of Ill., assignors to Brush Fuses, Inc., Des Plaines, Ill.

Filed Apr. 5, 1988, Ser. No. 177,637
Int. Cl.[4] H01H *85/14, 85/04*
U.S. Cl. 337—248 9 Claims



4. A cartridge fuse including a tube of insulation, first and second terminals at the ends of said tube and a link inter-connecting said terminals, at least one of said terminals comprising an end cap of sheet metal having at least one tab congruent to and aligned with a hole in the end cap, the tab and the area of the end cap in which the hole is formed being continuously interconnected portions of the sheet metal of the end cap.

4,841,357
DATA COMPANDER FOR DIGITAL VIDEO SIGNALS

David Gillies, Strasbourg, France, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Feb. 24, 1988, Ser. No. 166,529
Claims priority, application European Pat. Off., Mar. 7, 1987, 87103281.9
Int. Cl.[4] H04N *9/44*
U.S. Cl. 358—17 11 Claims

1. A data compander for digital video signals having a sampling frequency and a chrominance-subcarrier frequency, wherein the sampling frequency is locked to the chrominance-subcarrier frequency, said data compander comprising:

a lock-mode-changing filter having an input and an output, said input receiving said digital video signals as input video signals, said lock-mode-changing filter changing the lock of said input video signals from said chrominance-subcarrier frequency to the line frequency;

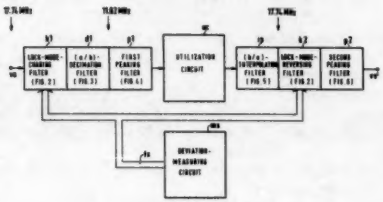
an (a/b)-decimation filter, wherein a and b are integers with the integer a less than the integer b, said (a/b)-decimation filter having an input and an output, said input of said

(a/b)-decimation filter connected to said output of said lock-mode-changing filter;

a first peaking filter having an input and an output, said input of said first peaking filter connected to said output of said (a/b)-decimation filter;

a utilization circuit for the line-locked signals, said utilization circuit having an input and an output, said input of said utilization circuit connected to said output of said first peaking filter;

a (b/a)-interpolation filter having an input and an output, said input of said (b/a)-utilization filter connected to said output of said utilization circuit;



a lock-mode-reversing filter having an input and an output, said input of said lock-mode-reversing filter connected to said output of said (b/a)-interpolation filter, said lock-mode-reversing filter changing the line lock of the signals into a lock with the chrominance-subcarrier frequency; and

a second peaking filter having an input and an output, said input connected to said output of said lock-mode-reversing filter, said output providing the companded video signals.

4,841,358

DEVICE FOR READING A COLOR IMAGE FROM AN ORIGINAL DOCUMENT WITH RECIPROCATING FILTER

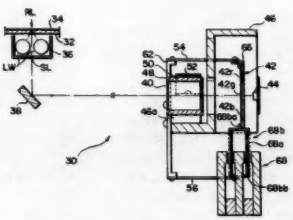
Yoshiaki Kammoto, and Masanori Saito, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 911,876

Claims priority, application Japan, Sep. 30, 1985, 60-214491

Int. Cl.[4] H04N 9/07

U.S. Cl. 358—75 **6 Claims**



1. A device for reading a color image from a color original document, comprising:

a line image sensor for decomposing the color image which is incident to a light-sensitive surface of said line image sensor into pixels each having a predetermined configuration and photoelectrically converting said pixels;

an optical arrangement for conducting the color image located on the read line to said light sensitive surface of said line image sensor;

flat filter means having a plurality of color separation stripe filters each having a predetermined size and separating a predetermined color component, said filters being spaced at a predetermined distance from each other and extending along the lenth of said light-sensitive surface wherein said predetermined distance is such that a light beam directed toward said line image sensor is temporarily and completely intercepted;

filter drive means for driving said flat filter means in a reciprocal motion in a plane which is perpendicular to an optical axis so as to cause any one of said filters to move into alignment with said optical axis; and

filter support means for supporting said filter means in such a manner as to allow said filter means to move in the direction of reciprocation while restricting movement of said filter means in other directions;

wherein said filter support means comprises a plurality of leaf springs which are identical in dimensions and spring coefficient.

4,841,359

PHOTOGRAPHIC APPARATUS FOR MAKING SIMULTANEOUS EXPOSURES

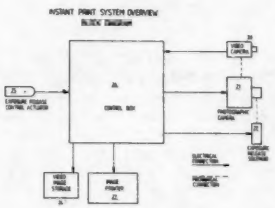
Ross H. Hawkins, Woodridge; David Laing, Acacia Ridge, and Bryan C. Bedington, Kangaroo Point, all of Australia, assignors to Bryna Pty. Ltd., Queensland, Australia

PCT No. PCT/AU87/00076, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05716, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 18, 1987, Ser. No. 157,480

Int. Cl.[4] H04N 1/46

U.S. Cl. 358—76 **18 Claims**



1. A system including a first camera for producing latent images of an object on film which may subsequently be processed; a second camera integral with or adjacent the first camera adapted to produce images substantially corresponding to the latent images of the first camera whereby respective images of the second camera correspond to respective latent images of the first camera; coding means including at least one light emitting display associated with the first camera for uniquely coding each said latent image, said coding means correspondingly coding the images produced by the second camera, said coding means further including a counter for providing in response to a release signal a code indicative of the number of latent images produced, an identification code matrix for producing a user code indicative of a particular user, a mixer for combining the latent image code and the user code, and drivers for driving said light emitting display; and, image display means for displaying or providing viewable images of the images produced by the second camera.

4,841,360

APPARATUS AND METHOD FOR THE REPRODUCTION OF COLORED ORIGINALS WITH GRAY BALANCE AND/OR CONTRAST ADJUSTMENT

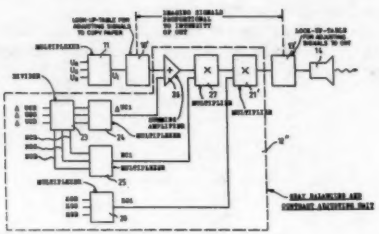
Klaus Birgmeir, Putzbrunn, Fed. Rep. of Germany, assignor to Agfa - Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,943

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629422

Int. Cl.[4] G03F *3/08;* **H04N** *1/40, 1/46, 9/64*

U.S. Cl. 358—80 **31 Claims**



1. A method of copying an original in which an imaging device makes an optical image of said original and said image is printed, comprising the steps of scanning said original; generating imaging signals based on the scanning step; adjusting at least one of a plurality of exposure parameters for the printing of said image in such a manner that each remaining exposure parameter of said plurality is substantially unaffected, the adjusting step including modifying said signals so that the latter are substantially proportional to a predetermined characteristic of said device or to the logarithm of said predetermined characteristic, and correcting said signals subsequent to modification, said correcting compromising multiplying said signals by a correction factor for said at least one exposure parameter or adding a correction factor for said at least one exposure parameter to said signals; and converting said signals into said image after the adjusting step by means of said imaging device.

4,841,361

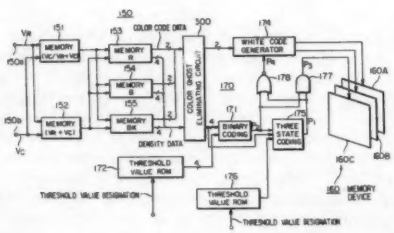
COLOR IMAGE PROCESSING APPARATUS

Masahiko Matsunawa, and Hiroyuki Yamamoto, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 128,276

Int. Cl.[4] G03F *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **7 Claims**



1. Apparatus for processing a color original image which comprises

(1) means for reading a color original image to generate a plurality of color component signals for each pixel of said original image;

(2) means for processing said color component signals to generate a plurality of color image signals wherein each of said color image signals comprises color code data and density data;

(3) means for eliminating a color ghost from said color code data, said color ghost eliminating means storing corrected color code data whereby said color ghost eliminating means outputs corrected color code data in accordance with said color code data, and;

(4) means for correcting said density data in accordance with said corrected color code data.

4,841,362

APPARATUS FOR GENERATING POSITIVE OR NEGATIVE IMAGE OUTPUT SIGNALS FROM EITHER POSITIVE OR NEGATIVE ORIGINALS

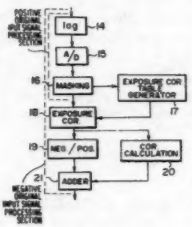
Hitoshi Urabe; Takao Shigaki, and Osamu Shimazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

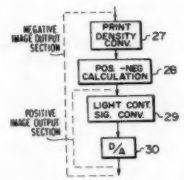
Continuation of Ser. No. 892,454, Aug. 4, 1986, Pat. No. 4,734,763, which is a continuation of Ser. No. 627,701, Jul. 3, 1984, abandoned. This application Mar. 4, 1988, Ser. No. 164,369

Claims priority, application Japan, Jul. 4, 1983, 58-121325; Mar. 12, 1984, 59-46897

Int. Cl.[4] G03F *3/08;* **H04N** *1/46*

U.S. Cl. 358—80 **4 Claims**





1. An apparatus for processing an image signal for positive-to-negative conversion in an image output system, which comprises means for converting a positive density signal representing a positive image to be printed with a desired density on an ultimate photosensitive printing material into a positive density printing signal for producing said positive image with said desired density, and means for converting said positive density printing signal into a negative density signal representing an intermediate negative image to be printed on an intermediate photosensitive printing material with a density such that when said negative image is used to print an image on said ultimate photosensitive printing material, said positive image with said desired density is obtained.

3. An apparatus for processing a negative original density signal, obtained by photoelectrically scanning a negative original and including three primary color signal components corresponding to respective primary color contents of said negative original, which apparatus comprises:

first converting means for converting said negative original

density signal into a corrected negative density signal representing a negative image recorded with a normal exposure (neither underexposed nor overexposed), and

second converting means for converting said corrected negative density signal thus obtained into a positive density signal having three primary color signal components and representing a positive image recorded with a normal exposure, a weight ratio of said three primary color signal components of said positive density signal always being equal to a predetermined ratio when said negative original is a gray original.

4. An apparatus for processing a negative original density signal, obtained by photoelectrically scanning a negative original and including three primary color signal components corresponding to respective primary color contents of said negative original, which apparatus comprises:

first converting means for converting said negative original density signal into a corrected negative density signal representing a negative image recorded with a normal exposure (neither underexposed nor overexposed), and

second converting means for converting said corrected negative density signal thus obtained into a positive density signal having three primary color signal components and representing a positive image recorded with a normal exposure, a weight ratio of said three primary color signal components of said positive density signal always being equal to 1:1:1 when said negative original is a gray original.

4,841,363
ENDOSCOPIC VIDEO SYSTEM

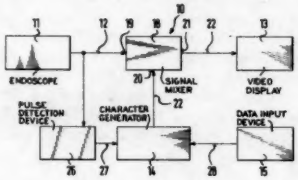
Felix Ams, Kämpfelbach, and Roland Schäfer, Bretten-Diedelsheim, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,441

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723228

Int. Cl.[4] A61B *1/04*

U.S. Cl. 358—98 **18 Claims**



1. An endoscopic television system, comprising:

(a) an endoscope adapted to generate an endoscopic image video signal representative of an endoscopic image, the endoscopic image video signal having synchronization signals therein;

(b) data input means for generating keying signals representative of characters;

(c) character generator means coupled to the data input means for generating character signals representative of characters in response to receipt of the keying signals, and for storing the character signals in a character store;

(d) synchronization means coupled to the endoscopic image video signal for generating a synchronization output signal representative of the synchronization pulses in the endoscopic image video signal;

(e) image control means associated with the character generator means and coupled to the synchronization output signal for reading the character signals stored in the character store as a function of the synchronization output signal, and for generating a character video signal;

(f) mixer means coupled to the endoscopic image video signal and the character video signal for mixing the signals together and to generate a composite endoscopic image/-character video signal;

(g) monitor means coupled to the composite endoscopic image/character video signal for displaying on a television screen the endoscopic image and characters represented by the composite signal; the endoscopic image being displayed on a portion of the screen, the characters being displayed on at least one image-free zone of the screen.

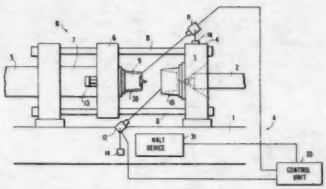
4,841,364
SYSTEM FOR CONFIRMING THE RELEASE OF A MOLDED ARTICLE IN AN INJECTION MOLDING APPARATUS AND FOR DETERMINING THE QUALITY OF THE ARTICLE

Norindo Kosaka, and Chikatoshi Yamaguchi, both of Shizuoka, Japan, assignors to Kawaguchi, Ltd., Shizuoka, Japan

Filed Apr. 15, 1988, Ser. No. 182,210

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—101 **11 Claims**



1. A system for detecting release of a molded article and determining the quality of the article in an injection molding machine having at least two mold members for forming a mold, said system comprising:

a first video camera for monitoring a first mold member and providing surface image data indicative thereof;

a second video camera for monitoring a surface of a second mold member which mates with the first mold member, and providing surface image data indicative thereof; and

control means including memory means for storing reference image data and the provided surface image data, means for comparing the reference image data and the provided surface image data, and means for determining the quality of a molded article and detecting release of the molded article from the mold members based upon comparison by said comparing means.

4,841,365
ARRANGEMENT FOR RECEIVING NUMERICAL DATA, COMPRISING A CIRCUIT FOR RECOGNIZING THE START OF PACKETS

André Guenot, Yerres, and Christian J. R. Cantou, Combs la Ville, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1987, Ser. No. 136,169

Claims priority, application France, Dec. 23, 1986, 86 18052

Int. Cl.[4] H04N *7/04*

U.S. Cl. 358—147 **7 Claims**

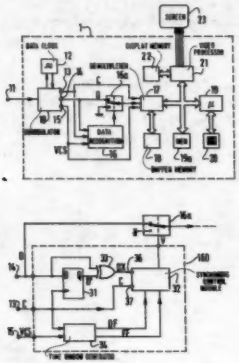
1. An apparatus for receiving digital data transmitted in the form of multiplexed packets in the video channel of a television transmission system, comprising:

a. a demodulator including:

i. means for generating data clock signals synchronized with reception of a bit synchronizing burst which is a sequence of n bits of alternating first and second logic levels at a start of each data packet after a line synchronizing signal, and

ii. means for supplying data signals,

b. a demultiplexer for receiving and demultiplexing the data signals and the data clock signals from the demodulator,
c. means for handing data to be viewed on a screen, and
d. a circuit for authorizing transfer of the data signals to the demultiplexer by supplying a recognition signal if the start of a data packet has been recognized, comprising:
i. a flip-flop having a data input coupled to receive the data signals from the demodulator and an output,
ii. means for effecting a modulo-2-sum, the effecting means having first and second inputs and an output, the first input being coupled to receive the data signals from



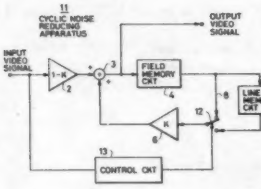
the demodulator, the second input being coupled with the output of the flip-flop,
iii. a time window generator for generating a time window which is open during an open period, and
iv. a synchronous control module having an input, coupled with the output of the effecting means, for storing a sequence of given states of its input during the open period of the time window and which synchronous control module has an has an output for supplying said recognition signal when the sequence of states is essentially a sequence of said first logic level.

4,841,366

CYCLIC NOISE REDUCING APPARATUS

Toshiyuki Katagiri, and Kazuhisa Marukado, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan

Filed Mar. 31, 1987, Ser. No. 32,828
Claims priority, application Japan, Mar. 31, 1986, 61-73349; May 26, 1986, 61-120550
Int. Cl.[4] H04N *5/213*
U.S. Cl. 358—167 **13 Claims**



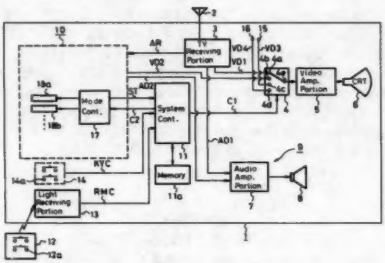
1. A noise reducing apparatus comprising:
means for delaying an input video signal by n lines for a first field and by n+1 lines for a second field to obtain a delayed video signal;
means for cyclically adding said delayed video signal for each field to a subsequent signal of said input video signal to obtain an output video signal having reduced noise; and
means for causing the delay of said first and second fields to be equal to a delay period of a frame delay to avoid half line shifting of said input video signal, said delay period corresponding to a delay of 2n+1 lines.

4,841,367

VIDEO SOURCE SELECTING SYSTEM

Norihito Ichikawa; Ikeo Someya; Osamu Oda, all of Tokyo, and Toshio Amano, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,153
Claims priority, application Japan, Jul. 29, 1986, 61-178172
Int. Cl.[4] H04N *5/268*
U.S. Cl. 358—181 **8 Claims**



1. A video source selecting system comprising:
(a) a switching means for sequentially selecting, for display, a monitor television receiver, video signals present on a plurality of channels, such video signals including a video signal from a built-in video tape recorder and a video signal from at least one external video input terminal; and
(b) control means for controlling said switching means, said control means operative in response to said built-in video tape recorder placed in its playback mode, to cause said switching means to successively select each of said plurality of video signals sequentially, and operative in response to said built-in video tape recorder not placed in its playback mode, to omit the video signal from said video tape recorder from selection by said switching means.

4,841,368

TELEVISION CUSTOMER CONTROL FUNCTIONS RESTORER

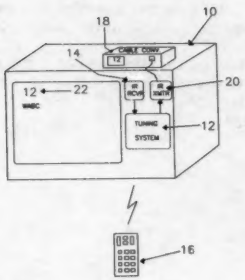
Robin B. Rumbolt; William F. Guerinot, and Daniel J. Dargis, all of Knoxville, Tenn., assignors to North American Philips Corporation, New York, N.Y.

Filed Jan. 21, 1988, Ser. No. 146,528
Int. Cl.[4] H04N *5/44*
U.S. Cl. 358—194.1 **7 Claims**

1. In a television receiver having a channel-associated function which is automatically executed when a television tuning system in the television receiver is selectively tuned to a selected channel, a function restorer for restoring said channel-associated function which is suppressed when said television tuning system is fixedly tuned to an available channel different from said selected channel and tunning of said television receiver is controlled by external tuning means, said function restorer comprising:
means for generating an external tuner selection signal and a first selected channel signal signifying said selected channel;
means responsive to said external tuner selection signal and said first selected channel signal for tuning said television

tuning system to said available channel and executing said channel-associated function; and

remote control transmitter means in said television receiver and connected to said television tuning system for generating, in dependence on said channel-associated function, a second selected channel signal corresponding to said first selected channel signal and transmitting said second selected channel signal to said external turning means for tuning said external tuning means to said selected channel.



4,841,369

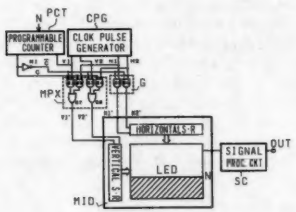
SOLID STATE IMAGING DEVICE WITH AN ARRANGEMENT FOR PROVIDING A HIGH SPEED SCAN OR OMITTING SCANNING IN AN UNNECESSARY PICK-UP RANGE

Shigeki Nishizawa, 3ku-27gou, 3550 Hayano, Mobara-shi, Chiba-ken; Iwao Takemoto, 1221-6 Hayano, Mobara-shi, Chiba-ken; Toshio Miyazawa, 853-27 Ariyoshicyou, Chiba-shi, Chiba-ken, and Tetsurou Izawa, 3550 Hayano, Mobara-shi, Chiba-ken, all of Japan

Filed Jul. 2, 1987, Ser. No. 69,178

Int. Cl.[4] H04N *5/335*

U.S. Cl. 358—213.26 **4 Claims**



1. A solid-state imaging system comprising:

a plurality of photo-electric converting elements arrayed in a plurality of rows and columns, a vertical scanning circuit for accessing predetermined ones of said elements in every one or more rows in a predetermined order, a horizontal scanning circuit for accessing predetermined ones of said elements in every column in a predetermined order, an output terminal, an output circuit for serially deriving the converted electrical signal to said output terminal in cooperation with said vertical and horizontal scanning circuits, and an exchanging circuit for making the scanning rate of said vertical scanning circuit normal in a first mode and equal to that of said horizontal scanning circuit in said second mode.

4,841,370

AUTOMATIC FOCUSING CIRCUIT FOR AUTOMATICALLY MATCHING FOCUS IN RESPONSE TO VIDEO SIGNAL

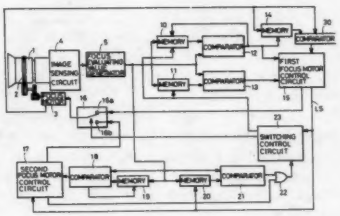
Hirotsugu Murashima, Yamatotakada; Satoru Maeda, Hirakata, and Shunji Hirano, Takatsuki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 13, 1987, Ser. No. 120,583

Claims priority, application Japan, Nov. 17, 1986, 61-273212; Dec. 19, 1986, 61-304411; Feb. 18, 1987, 62-34763; Feb. 26, 1987, 62-43405; Feb. 26, 1987, 62-43406; Mar. 4, 1987, 62-49513

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 **18 Claims**



1. An automatic focusing system for automatically matching a focus in response to a video signal obtained from image sensing means having a focusing lens and an image sensor, comprising:

relative position changing means for changing the positional relationship of said focusing lens and said image sensor relative to each other in the direction of an optical axis of said focusing lens,

focus evaluating value detecting means for detecting a level of a high frequency component of the video signal obtained from said image sensing means every constant period, converting the level into either a focus evaluating value which takes the maximum value in the in-focus positional relationship or a focus evaluating value which takes the minimum value in the in-focus positional relationship,

first control means connected to said focus evaluating value detecting means for controlling said relative position changing means so that the positional relationship of said focusing lens and said image sensor is once fixed in the positional relationship where said focus evaluating value takes the maximum value or the minimum value,

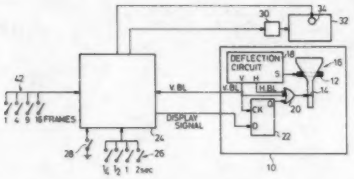
second control means for changing, by a very small amount, the positional relationship of said focusing lens and said image sensor and detecting the change of said focus evaluating value corresponding to the very small change after the relationship of said focusing lens and said image sensor is once fixed by said first control means, so that the positional relationship of said focusing lens and said image sensor is corrected to the maximal point or the minimal point of said focus evaluating value, and

switching control means for resuming controlling the positional relationship of said focusing lens and said image sensor by said first control means when the correction amount of the positional relationship of said second focusing lens and said image sensor by said second control means exceeds a predetermined value.

4,841,371
APPARATUS FOR RECORDING CRT IMAGE

Mikio Nishiyama; Tatsuo Yoshino, and Taizo Akimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1987, Ser. No. 95,502
Claims priority, application Japan, Sep. 11, 1986, 61-214915
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—244 21 Claims



1. An apparatus for recording CRT image by a recording device comprising:

vertical synchronizing signal separating means for separating vertical synchronizing signals from a video signal;

counter means for counting the number of said vertical synchronizing signals;

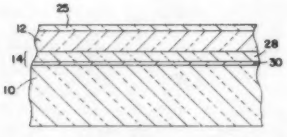
raster erase means for obscuring the scanning lines of a CRT image; and

control means for controlling the exposure time during which said CRT image is recorded by said recording device, said control means controlling said exposure time so that, if K and n are integers and if the number of said vertical synchronizing signals is represented by $2^k \times n$, said exposure time corresponds to $2^k \times n$.

4,841,372
CATHODE RAY TUBE CONTRAST ENHANCEMENT SYSTEMS

Sae D. Lee, Buffalo Grove, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 894,984, Aug. 8, 1986. This application Dec. 15, 1986, Ser. No. 941,458
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] H01J *29/87*
U.S. Cl. 358—247 29 Claims



9. A cathode ray tube comprising a faceplate and an implosion panel bonded to said faceplate by UV-curable non-epoxy adhesive incorporating neutral density contrast-enhancing light-absorptive means.

19. A method of manufacturing a cathode ray tube having a faceplate and an implosion panel thereover comprising the steps of:

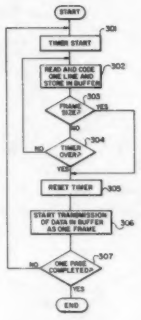
interposing an ultraviolet-curable non-epoxy adhesive material incorporating neutral density contrast-enhancing light-absorptive means between said implosion panel and said faceplate;

and curing said adhesive material by exposure to ultraviolet radiation to bond said implosion panel to said faceplate.

4,841,373
FACSIMILE TRANSMISSION CONTROL METHOD IN WHICH A FRAME OF STORED IMAGE DATA IS TRANSMITTED WHEN EITHER A PREDETERMINED TIME HAS ELAPSED OR A PREDETERMINED AMOUNT OF IMAGE DATA HAS BEEN STORED

Kazuo Asami, Yokohama, and Fumihiro Ogasawara, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,236
Claims priority, application Japan, Jan. 19, 1987, 62-8305
Int. Cl.[4] H04N *1/32, 1/21, 1/40*
U.S. Cl. 358—257 5 Claims



1. A facsimile transmission control method, comprising the steps of:

establishing a transmission line between a transmitter and a receiver;

implementing a predetermined transmission control procedure between said transmitter and said receiver to thereby establish parameters necessary for transmission of data between said transmitter and said receiver; and

reading an original to produce image data and storing said image data for transmission while at the same time monitoring the amount of image data stored for transmission and also monitoring a timer, wherein, if said amount of image data stored for transmission has reached a predetermined amount before said timer has reached a predetermined time, said amount of image data stored for transmission is formed into a frame of data, which is then transmitted from said transmitter to said receiver, whereas, if said timer has reached said predetermined time before said amount of image data stored for transmission has reached said predetermined amount, then said amount of image data stored for transmission is formed into a frame of data, which is then transmitted from said transmitter to said receiver.

4,841,374
IMAGE PROCESSING METHOD

Matahira Kotani, Nara; Motohiko Hayashi, and Masafumi Yamanoue, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 18, 1986, Ser. No. 931,843
Claims priority, application Japan, Nov. 18, 1985, 60-259473
Int. Cl.[4] H04M *1/40*
U.S. Cl. 358—280 4 Claims

1. An image processing method for expressing a halftone-including original image obtained from an image reader having binary black-and-white pixels and for reproducing the halftone-including original image as a binary-coded output, wherein said image processing method comprises the steps of:

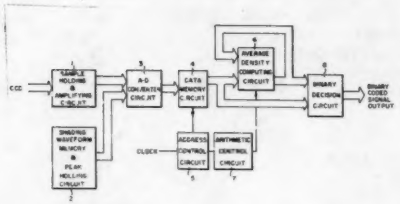
scanning and sampling the halftone-including original image

and developing a digital image signal, therefrom, corresponding to a specific pixel line;

storing said digital image signal at a predetermined address in memory means;

calculating a first average density value for a first specific pixel line corresponding to a present image line of said digital image signal centered about a subject pixel;

calculating a second average density value for a second specific pixel line corresponding to a line preceding and



adjacent to said present image line stored in said memory means and adjacent to said present image line;

calculating an average density output by averaging said first and second average density values; and

comparing the density value of said subject pixel with said average density output to develop a binary black-or-white pixel value for said subject pixel region, thereby producing the binary-coded output for correcting the halftone-including original image gradation.

4,841,375

IMAGE-RESOLUTION CONVERSION APPARATUS FOR CONVERTING A PIXEL-DENSITY OF IMAGE DATA

Shunichi Nakajima, and Koji Izawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 14, 1987, Ser. No. 38,362

Claims priority, application Japan, May 29, 1986, 61-124209; May 29, 1986, 61-124211; May 29, 1986, 61-124212

Int. Cl.[4] H04N *1/00*

U.S. Cl. 353—280 **24 Claims**

TERMINAL NO.	CONVERSION RATIO	
	MAIN SCANNING DIRECTION	SUB-SCANNING DIRECTION
PC I	2	2
PC2	2	2
G III	1.97	2.05
G IV	1	1

1. An image-resolution conversion apparatus for converting a pixel-density of an image data, comprising:

input means for receiving image data which can be of various pixel densities;

selection means, having a plurality of pixel-density conversion ratio data items, respectively representing ratios of pixel-density conversion for converting the pixel-density of the image data to an other predetermined pixel density stored therein for selecting one of the plurality of stored pixel-density conversion ratio data responsive to the pixel density of the image data received by said input means; and

pixel-density converting means, receiving the image data received by said input means and the pixel density conversion ratio data corresponding to a ratio between a present pixel density and an input pixel density from said selection means, for performing a predetermined arithmetic operation on the basis of the pixel-density conversion ratio data from said selection means, to convert the pixel density of the image data to said present pixel density.

4,841,376

SHADING CORRECTING METHOD ENABLING PREVENTION OF EFFECT OF NOISE AND APPARATUS THEREFOR

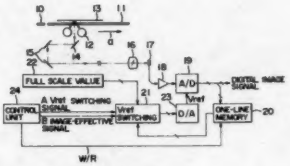
Hiroyuki Yamamoto, and Masahiko Matsunawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 80,872

Claims priority, application Japan, Aug. 15, 1986, 61-191207

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—282 **2 Claims**



1. A shading correcting apparatus comprising an A/D converter which converts an image signal into a digital signal and a reference voltage switching circuit which switches over a shading correction signal set as a first reference voltage of said A/D converter and a reference signal being set as a second reference voltage and different from said correction signal and applies same on said A/D converter, wherein the aforesaid first reference Voltage is outputted during an effective period of an image signal by said reference voltage switching circuit while the aforesaid second reference voltage is outputted thereby out of the effective period.

4,841,377

CONTINUOUS IMAGE ESTIMATION METHOD

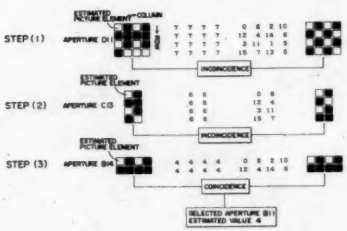
Seiichiro Hiratsuka, and Masahiko Matsunawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 62,556

Claims priority, application Japan, Jun. 14, 1986, 61-138892; Jun. 14, 1986, 61-138893

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—283 **19 Claims**



1. A continuous tone image estimation method of a binary image, comprising the steps of: setting a plurality of kinds of scanning aperatures and a plurality of scanning apertures to be in different positions from one another for each of said plurality of kinds in the binary image selecting only one of said scanning apertures satisfying a predetermined condition for each picture element of a continuous tone image to be estimated; and estimating said continuous tone image on the basis

of the number of white or black picture elements in the selected scanning aperture.

4,841,378

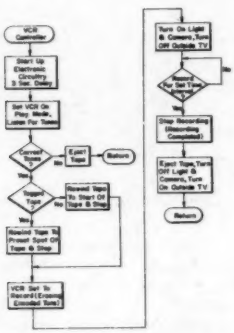
VIDEO CAMERA ENABLEMENT SYSTEM UTILIZING A VIDEO CASSETTE CHARACTERISTIC

Harmon I. Cogert, Woodland Hills, Calif., assignor to Short Takes, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 914,307, Oct. 2, 1986, abandoned. This application Feb. 4, 1988, Ser. No. 152,335

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—335 **10 Claims**



1. A video recording system comprising:

a camera producing a video picture signal when operated;

a video cassette recorder connected to the camera for recording the video picture signal on a video cassette; and

means for enabling operation of the camera if the cassette possesses a predetermined physical characteristic and for preventing operation of the camera if the cassette does not possess the predetermined physical characteristic.

4,841,379

TIME-BASE ERROR CORRECTION APPARATUS FOR VIDEO TAPE OR DISK PLAYER

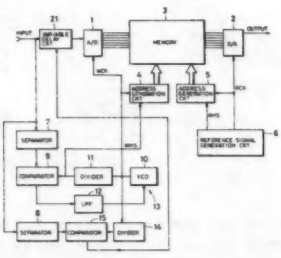
Toru Akiyama, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 17, 1987, Ser. No. 97,893

Claims priority, application Japan, Sep. 17, 1986, 61-218618

Int. Cl.[4] H04N *5/95*

U.S. Cl. 358—337 **3 Claims**



1. A time-base error correction apparatus comprising:

an A/D converter circuit for analog-to-digital conversion of an input video signal on the basis of a write clock;

a memory for storing an output of said A/D converter circuit;

a D/A converter circuit for digital-to-analog conversion of an output of said memory on the basis of a read clock;

a separator circuit for separating a synchronizing signal from said video signal;

a PLL circuit for generating said write clock in response to an output of said separator circuit;

a detector circuit for producing a residual time-base error signal representing an amount of time-base error between said video signal and said write clock; and

a variable delay circuit for delaying said video signal on the basis of said residual time-base error signal, a resulting delayed signal being applied to an input of said A/D converter circuit.

4,841,380

REPRODUCING APPARATUS FOR INTERMITTENTLY DRIVING RECORDING MEDIUM

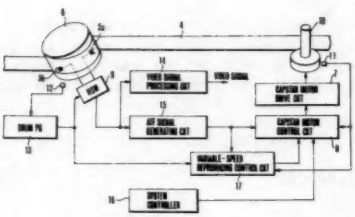
Susumu Kozuki, and Keiji Satoh, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 2, 1986, Ser. No. 936,843

Claims priority, application Japan, Dec. 5, 1985, 60-272600

Int. Cl.[4] H04N *5/783;* **G11B** *15/52*

U.S. Cl. 360—10.2 **11 Claims**



1. An apparatus for reproducing recorded signals from a tape-shaped recording medium in which a plurality of oblique tracks are formed in parallel, comprising:

(a) a reproducing head;

(b) means for forming a tracking error signal indicating a tracking error of said reproducing head by utilizing an output therefrom;

(c) transporting means for intermittently transporting said recording medium in a longitudinal direction thereof;

(d) pulse generating means for generating timing pulses in response to a level of said tracking error signal;

(e) delay means for delaying a timing indicated by said timing pulses;

(f) means for determining a start timing and a stop timing at which the transportation of said recording medium by said transporting means is started and stopped, said means determining either said start timing or said stop timing, or both, corresponding to the timing delayed by said delay means;

(g) a plurality of adjusting means arranged to be able to manually adjust a delay time given by said delay means;

(h) producing means for producing information with respect to a track pitch of said tracks; and

(i) selection means for selectively using said plurality of adjusting means on the basis of information produced by said producing means.

4,841,381

STILL REPRODUCTION CONTROLLING CIRCUIT

Akira Toguchi, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

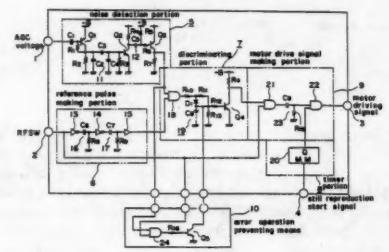
PCT No. PCT/JP86/00480, § 371 Date May 8, 1987, § 102(e) Date May 8, 1987, PCT Pub. No. WO87/01894, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 16, 1986, Ser. No. 54,911

Claims priority, application Japan, Sep. 18, 1985, 60-142168[U]

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 360—10.3 **1 Claim**



1. A still reproduction controlling circuit for controlling a motor driving a tape at a low speed, comprising:

noise detection means for detecting a state in which a reproduction output is falling in an FM brilliance signal;

reference pulse generating means for generating a reference pulse of a predetermined width corresponding to the vertical blanking period, in response to a head change over signal;

discriminating means, receiving outputs from said noise detection means and said reference pulse generating means, for outputting a stop motor control signal to stop the driving of said motor when the output of said noise detection signal coincides with said reference pulse, to drive said noise band into a vertical blanking period; and

an error operation preventing means, connected to said noise detection means and receiving said head change over signal, for outputting an error prevention signal to said discriminating means in response to the detection of noise coinciding in time with said reference pulse, such that said stop motor control signal from said discriminating means is inhibited.

4,841,382

AUDIO RECORDING DEVICE

Akihiko Sasaki, and Hiroaki Atsumi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 20, 1987, Ser. No. 110,340

Claims priority, application Japan, Oct. 20, 1986, 61-247608; Oct. 20, 1986, 62-247610

Int. Cl.⁴ G11B *5/00*

U.S. Cl. 360—32 **4 Claims**

1. An audio recording device comprising:

A/D converter means for converting an inputted analog sound signal to a digital sound signal;

memory means for storing said digital sound signal;

D/A converter means for converting said digital sound signal read out of said memory means to an analog sound signal;

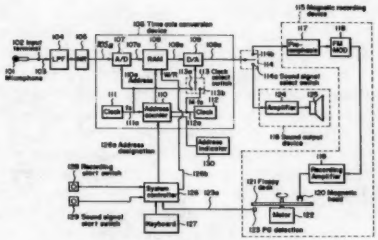
an address counter for designating an address of said memory means to write or read signals therefrom;

a magnetic recording device for recording said analog sound signal on a rotary magnetic recording medium;

a sound output device for receiving said analog sound signal to output a sound;

a sound signal select switch for switching said analog sound signal to said magnetic recording device or said sound output device;

a system controller for writing said digital sound signal into said memory means sychronously with a low-frequency first clock signal for recording said analog sound signal on said recording medium by said magnetic recording device, by reading said digital sound signal from said memory means synchronously with a high-frequency second clock signal and transmitting a D/A converted analog sound signal select switch, and for outputting a sound from said



sound output device by reading said digital sound signal from said memory means synchronously with said first clock signal and transmitting a D/A converted analog sound signal to said sound output device through said sound signal select switch;

an input device for setting a memory address to start writing and setting conditions for selecting said sound signal to be outputted as a sound or to be recorded by said magnetic recording device; and

an address indicator for indicating an address designated by said address counter.

4,841,383

CONTROL PULSE RECORDING CIRCUIT FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

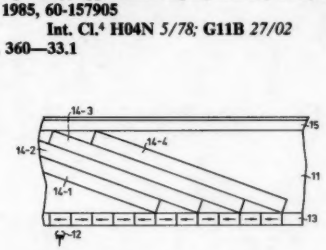
Naomichi Nishimoto, Toyko; Takeshi Okauchi, Chigasaki, and Koichi Kido, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Continuation of Ser. No. 886,020, Jul. 16, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 206,949

Claims priority, application Japan, Jul. 16, 1985, 60-156679; Jul. 17, 1985, 60-157905

Int. Cl.⁴ H04N *5/78;* **G11B** *27/02*

U.S. Cl. 360—33.1 **6 Claims**



1. A control pulse recording circuit for a magnetic recording and reproducing apparatus, said control pulse recording circuit comprising:

a control head for reproducing at least leading edges of square wave control pulses from a control track of a pre-recorded magnetic tape which is pre-recorded with the control pulses with a constant period, and for recording a recording voltage which is to be recorded and is supplied thereto so as to re-write positions of trailing

edges of said control pulses within an interval between two mutually adjacent leading edges of the pre-recorded control pulses on the pre-recorded magnetic tape so that a duty cycle of the control pulses becomes a value in accordance with a value of recording data to be recorded by a re-writing operation, said leading edges of the control pulses reproduced by said control head being used in a servo circuit within the magnetic recording and reproducing apparatus;

detecting means for detecting the leading edges of the control pulses reproduced by said control head and for producing a detection pulse signal;

recording voltage generating means supplied with the output detection pulse signal of said detecting means and said recording data for generating a recording voltage having three levels including a zero level, a polarity of said recording voltage changing across said zero level at a time in accordance with said recording data in an interval from a starting time when the re-writing operation is started between the two mutually adjacent leading edges of the pre-recorded control pulses to an ending time when the re-writing operation is ended; and

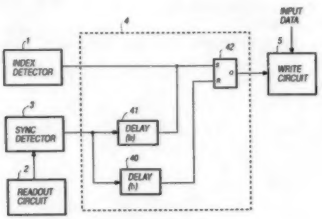
switching means for selectively supplying said recording voltage from said recording voltage generating means to said control head during said interval from the starting time to the ending time so as to switch a mode of said control head into a recording mode, and for blocking the supply of said recording voltage to said control head at a time which is after a predetermined time from the ending time where said recording voltage becomes approximately said zero level, and is immediately before a next leading edge of the control pulses so as to switch the mode of said control head into a reproducing mode.

4,841,384

SERVO PROTECTION CIRCUIT FOR DISK DRIVE

Yoichi Murakami, Tokyo, and Yoshihisa Okawa, Gunma, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,146
Claims priority, application Japan, Jul. 16, 1987, 62-178055
Int. Cl.[4] G11B *15/04, 21/10*
U.S. Cl. 360—60 **3 Claims**



1. A servo protection circuit for protecting a servocontrol signal prerecorded in a magnetic recording disk from being erased by write operation, comprising:

sync detector means for generating a sync pulse in response to a sync code prerecorded in said magnetic disk; and

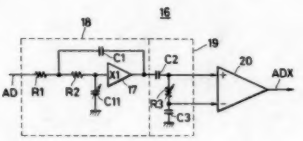
servo protection means for generating a servo protect pulse in response to said sync pulse and disabling write operation of said disk during the presence of said servo protect pulse, said servo protect pulse having a duration variable with the interval between successive ones of said sync pulse.

4,841,385

DATA SIGNAL REPRODUCING APPARATUS

Kenji Nakano, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,830
Claims priority, application Japan, Oct. 11, 1986, 61-241594
Int. Cl.[4] G11B *5/03, 5/09*
U.S. Cl. 360—65 **10 Claims**



1. A data reproducing apparatus for reproducing data recorded on a magnetic recording medium using a magnetic transducing head by modulating an encoded digital information signal as first and second frequency components in accordance with logic states "0" to "1, comprising in combination;

an equalizing circuit interposed between a reproducing magnetic transducing head and a decoder or demodulator for the encoded digital information signal, for compensating for signal degradation caused by the electromagnetic transducing characteristic between the magnetic recording medium and said recording and reproducing transducing head, characterized in that said equalizing circuit comprises:

(a) a low-pass filter for controlling at least the amplitude of the second frequency signal component;

(b) a high-pass filter for controlling at least the amplitude of the first frequency component; and

(c) switching means for switching at least the pass band of said low-pass filter or said high-pass filter in correspondence to characteristics of the output signal from said reproducing transducer head,

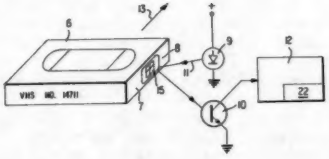
wherein an equalization characteristic corresponding to logic state "0" or "1" is achieved by maximizing an eyeopening ratio or aperture opening ratio of an eye-pattern thereof.

4,841,386

CASSETTE RECORDER WITH RECORDING PROGRAMMING

Rolf Schiering, Hemmingen, Fed. Rep. of Germany, assignor to Deutsche AG für Unterhaltungeselectronic OHG, Villingen-Schwenningen, Fed. Rep. of Germany

PCT No. PCT/EP87/00073, § 371 Date Sep. 11, 1987, § 102(e) Date Sep. 11, 1987, PCT Pub. No. WO87/05129, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 13, 1987, Ser. No. 117,066
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605563
Int. Cl.[4] G11B *15/07, 23/087*
U.S. Cl. 360—69 **13 Claims**



1. A receiver cassette recorder and, for use therewith, a

cassette for selectively automatically recording programming based on parameters that have been selected by a user, said cassette comprising a cassette housing having thereon a dedicated area for a user to mark indicia representing parameters to be read by said recorder so that selected programs can be automatically recorded; and said cassette recorder comprising:

reading means for reading indicia on said cassette; and

control means connected to said reading means for receiving a signal indicative of the indicia read by said reading means, and said control means including a memory connected to said control means for storing the signals received by said control means.

4,841,387

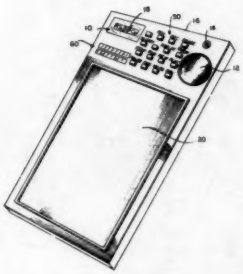
ARRANGEMENT FOR RECORDING AND INDEXING INFORMATION

Diane J. Rindfuss, 395 Oak Creek Dr., Wheeling, Ill. 60090

Filed Dec. 15, 1987, Ser. No. 133,336

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—72.1 **34 Claims**



1. An arrangement for recording information relating to an event on a recording medium, and for indexing handwritten notations concerning the event to the recorded information, comprising:

a recording device for recording information onto a recording medium;

means for receiving handwritten notations on a writing surface;

means for sensing relative positions of the recorded information on the recording medium, and for sensing positions of corresponding handwritten notations on the writing surface;

means for correlating the respective positions of the recorded information to the positions of the handwritten notations; and

playback means for locating and reproducing portions of the recorded information in response to identification of corresponding portions of the handwritten notations.

4,841,388

RECORDING APPARATUS FOR REARECORDING BY REPOSITIONING RECORDING MEDIUM

Taizou Hori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 123,918

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—721 **8 Claims**

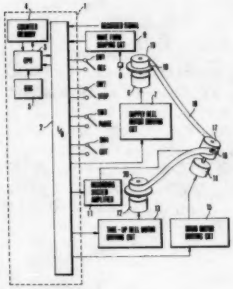
1. A recording apparatus for recording information signal on a recording medium, comprising:

(a) recording means for recording an information signal on said recording medium;

(b) moving means for moving said recording medium relative to said recording means;

(c) instruction means for giving instructions to commence a recording action on said information signal, to bring said recording action to a pause and to make preparation for a re-recording action on said information signal;

(d) position information holding means for holding position information on the position of said recording medium obtained relative to said recording means at the start of said signal recording action; and



(e) control means for controlling said moving means, on the basis of the position information held by said position information holding means, to bring said recording medium back to the relative position thereof obtained at the start of said recording action on said information signal in case that said instruction means gives an instruction to make preparation for re-recording said information signal after a previous instruction is given to bring said recording action to a pause.

4,841,389

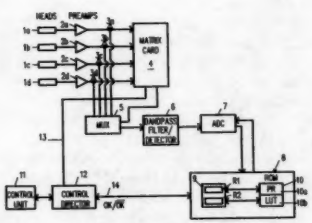
MAGNETIC TRANSDUCER CRASH ANTICIPATION AND RESPONSE METHOD AND APPARATUS

Roger F. Hoyt; Carl M. Jefferson, both of San Jose, and Steven E. Millman, Campbell, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1987, Ser. No. 60,578

Int. Cl.[4] G11B *5/60, 21/02*

U.S. Cl. 360—75 **18 Claims**



1. A method for denoting the likelihood of an impending crash of a magnetic transducer against a rotating magnetic recording medium due to deterioration in flying height of the transducer below a predetermined acceptable value comprising the steps, while the medium is being rotated at substantially constant velocity, of:

over a predetermined area of said recording medium, writing one signal at a predetermined amplitude and at a frequency f_l;

reading back said one signal at frequency f_l and storing its spectral amplitude;

overwriting said predetermined area with another signal at said predetermined amplitude but at a higher frequency f_h;

then reading back the component of said one signal remaining after said overwriting and storing its spectral amplitude;

calculating the ratio of the spectral amplitudes of said one signal as read before said overwriting and said remaining component of said one signal as read after said overwriting; and

using said ratio to initiate a desired control operation when said ratio denotes that flying height is below said acceptable value.

4,841,390

DIGITAL SIGNAL REPRODUCING APPARATUS

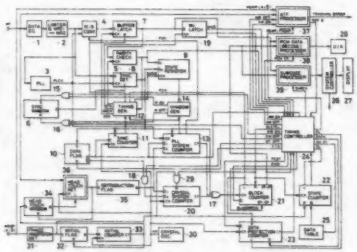
Seiichi Yokosawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 104,019

Claims priority, application Japan, Oct. 3, 1986, 61-234480; Oct. 6, 1986, 61-236245; Oct. 7, 1986, 61-237247; Oct. 8, 1986, 61-238153; Nov. 7, 1986, 61-264039

Int. Cl.[4] G11B *21/10, 5/09*

U.S. Cl. 360—77.14 **11 Claims**



1. In a digital signal reproducing apparatus having at least two rotary heads for reproducing a plurality of signals on a recording medium, said plurality of signals containing a digital signal, a tracking pilot signal composed of a frequency signal with a small azimuth-effect, and a sync signal, said plurality of signals being recorded on each of a plurality of helical tracks in a predetermined format with the recording region in one track being independent of the recording region in another track in the longitudinal direction, the positions of the pilot signals recorded on three consecutive tracks differing from one track to another, with the sync signal being recorded on a position corresponding to one of the two adjacent tracks, each of said rotary heads having a width greater than the width of each track on which it scans, each of said rotary heads outputting, as a result of reproduction of each track, the pilot signal on the on-track and the crosstalks of the pilot signals on the two adjacent tracks, and a capstan servo system being controlled by the difference between the levels of crosstalk of the pilot signals on said two adjacent tracks so as to ensure that said rotary heads will correctly scan each track, the improvement comprising:

a head touch detector circuit that detects the output of an RF signal as a result of contact that is established between said recording medium and each of said rotary heads;

a reproduction flag generator circuit which, in response to the output of said head touch detector circuit, indicates that the system is in a replay mode;

an ATF sync window forming circuit which forms an ATF sync window that detects and protects a tracking ATF sync signal assuming the period during which said sync signal is reproduced in response to said reproduction flag; and

a data sync window forming circuit which forms a data sync window that detects and protects a data sync signal which serves as a reference for reading data, assuming the period over which said sync signal is reproduced in response to said reproduction flag;

both of said windows being opened at the time when said head touch detector circuit detects the output of an RF signal, and at the time when either one of said ATF and data sync signals is detected, the window for the other sync signal being turned off and only the window for said detected signal being controlled.

4,841,391

ROTARY HEAD TYPE RECORDING AND/OR REPRODUCING APPARATUS HAVING MODE SELECTING MECHANISM

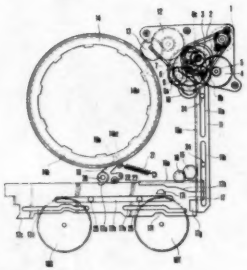
Akio Iwasaki, and Kenichi Nagasawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 88,126

Claims priority, application Japan, Aug. 27, 1986, 61-200534; Aug. 27, 1986, 61-200540; Aug. 27, 1986, 61-200541; Aug. 28, 1986, 61-202009; Aug. 28, 1986, 61-202012; Aug. 28, 1986, 61-202024

Int. Cl.[4] G11B *15/665, 15/18*

U.S. Cl. 360—85 **14 Claims**



1. A rotary head type recording and/or reproducing apparatus comprising:

(a) a cylinder member having a rotary head;

(b) tape loading means for winding a tape-shaped recording medium stretched between a pair of reels onto said cylinder member, said loading means having a movable guide post for guiding said tape-shaped recording medium;

(c) transportation means for transporting said tape-shaped recording medium and having a plurality of modes;

(d) a motor;

(e) a mode lever having a plurality of cams and slidable between a plurality of stop positions;

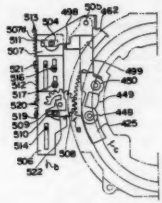
(f) mode control means for changing a mode of said transportation means to one of said plurality of modes depending upon the stop position of said mode lever; and

(g) transmitting means for transmitting a driving force of said motor to said tape loading means and said mode lever, said transmitting means including a first rotary gear which is rotated by the driving force produced by said motor, a plurality of revolving gears which are in meshing engagement with said first rotary gear and are revolvable around said first rotary gear, while each of them is rotatable around its rotating axis, a second rotary gear which is rotatable coaxially with said first rotary gear and pivotally supports said plurality of revolving gears and a third rotary gear which is rotatable coaxially with said first rotary gear and is in meshing engagement with said plurality of revolving gears, wherein said driving force is transmitter through said second rotary gear to one of said guide post and said mode lever and through said third rotary gear to the other of said guide post and said mode lever.

4,841,392
TAPE LOADING APPARATUS HAVING AN ARRANGEMENT FOR CONTROLLING MOVEMENT OF A GUIDE ROLLER HOLDER ARM

Hidenori Muramatsu; Kimichika Yamada; Katsuya Nozawa, and Yoshihiko Goto, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 922,438
Claims priority, application Japan, Oct. 29, 1985, 60-241852
Int. Cl.[4] G11B *15/66*
U.S. Cl. 360—85 5 Claims

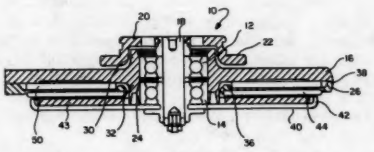


1. A tape loading mechanism comprising:
a rotating drum head;
a stationary guide rail supported adjacent said drum head and having therein a guide groove;
a rotatable drive gear;
a ring-shaped loading gear which extends around said drum head, which is rotatably supported, and which engages said drive gear and is rotated in response to rotation of said drive gear;
a loading block and a subblock supported in said guide groove of said guide rail for independent movement therealong and each having thereon a post which can engage a tape from a cassette, and means operatively coupling each of said loading block and said subblock to said loading gear for effecting movement of said loading block and said subblock along paths of travel from respective initial positions to respective advanced positions in response to movement of said loading gear, wherein as said loading block and said subblock move to their advanced positions said posts thereon pull the tape into a configuration disposed along a tape path extending partway around said drum head;
a movable rack member having a rack thereon and means for effecting movement of said rack member with said subblock;
a holder arm which has a tape guide roller rotatably supported at one end thereof and which is supported at a location spaced from said one end thereof for pivotal movement between advanced and retreated positions in which, when said loading block and said subblock are in their advanced positions, said guide roller is respectively at first and second locations in which it respectively engages and is spaced form a tape extending along said tape path, said first and second locations respectively being disposed along and spaced from said path of travel of said subblock;
a further gear which is rotatably supported and is engageable with said rack on said rack member, said further gear being rotated by said rack in response to movement of said rack after said subblock has passed said first location; and
holder arm operating means responsive to rotation of said further gear by said rack for effecting movement of said holder arm from said retreated position thereof to said advanced position thereof.

4,841,393
SPINDLE MOTOR FOR A DISC DRIVE

Donald J. MacLeod, Santa Cruz County; Miles L. Peterson, Santa Clara County, and Charles G. Nowark, Jr., Santa Cruz County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 2, 1987, Ser. No. 116,044
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—98.07 11 Claims

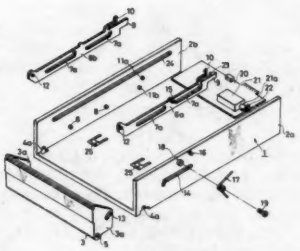


1. A spindle motor for use in a disc drive including a base casting for the drive, the motor comprising a shaft extending through said base casting and carrying a hub supporting one or more discs for rotation, said shaft being supported for rotation in said casting by one or more bearings, rotation of the shaft being controlled by an axial air gap motor comprising a flat rotor connected to the shaft and extending axially parallel to the base casting of the housing, said rotor comprising a magnet supported by a rotor support plate carried on an end of said shaft, means comprising a single printed board supported to have first and second surfaces essentially out of contact with said base casting and said rotor support plate for supporting on one surface thereof a plurality of axially oriented coils in a toroidal path around said shaft and in a plane parallel to said magnet, and on the other of said surfaces a toroidal magnetic return path element mounted on the opposite side of said axially oriented coils from said rotor, said magnetic return path being formed of a wound coil of thinly sliced sheet steel, thereby forming a magnetic path comprising said magnet, said coils and said return path element, whereby a low profile spindle motor is achieved.

4,841,394
COVER MECHANISM FOR A RECORDING MEDIUM HOLDING DEVICE

Youzi Tomizawa, Yokohama, and Masashi Mizutani, Kawasaki, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 28, 1987, Ser. No. 90,613
Claims priority, application Japan, Oct. 31, 1986, 61-167560[U]
Int. Cl.[4] G11B *17/04, 17/032, 17/03*
U.S. Cl. 360—99.06 2 Claims



1. A recording medium holding device comprising:
a casing having a front end, a rear end, and a pair of sidewalls each of said sidewalls defining a hole at the bottom

thereof adjacent to said front end, said sidewalls provided with a plurality of guide pins projecting inward;

cover pivotally provided at said front end of said casing and having a pair of sidewalls, each of said cover sidewalls having a laterally projecting pin movably received by said hole of one of said casing sidewalls, said cover sidewalls further defining an oblong hole;

a pair of transversely spaced parallel sliding levers slidably mounted to the inner side of said casing sidewalls said levers defining longitudinally extending guide slots for movably receiving said guide pins of said casing sidewalls, said sliding levers each having an upwardly bent and forwardly inclined front end provided with a laterally projecting pin movably received by said oblong hole of said cover sidewall, said levers each further having a sliding hook and a guide projection disposed at the rear end of said levers;

a resilient member for biasing one of said sliding levers toward said front end of said casing;

a solenoid having a lock claw selectively engaged with an engaging claw formed in a said guide projection of a said lever for holding said sliding lever against the biasing force of said resilient member;

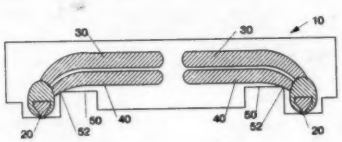
whereby, upon operation, said lock claw disengages said engaging claw of said guide projection and said resilient member biases said sliding levers toward said front end of said casing such that said sliding hook cooperates with a projection formed on a recording medium to move said recording medium toward said front end of said casing.

4,841,395

STATIC ELECTRICITY DISCHARGE DEVICE FOR A MAGNETIC HEAD

David C. Craft, Eden Prairie, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Mar. 21, 1988, Ser. No. 171,052
Int. Cl.[4] G11B *5/60, 5/147*
U.S. Cl. 360—103 **4 Claims**



1. In a magnetic head having a non magnetic dielectric material with an outer surface, a set of magnetic circuits, including at least one pole exposed at said outer surface, and a plurality of conductors extending from said magnetic circuits through said non magnetic dielectric material, said non magnetic dielectric material mounted on a conductive body, the improvement comprising:

a recess formed in said non magnetic dielectric material sufficiently deep to expose a portion of one of said conductors to provide a static electricity discharge path between said exposed portion of said one of said conductors and said conductive body along said outer surface of said non magnetic dielectric material.

4,841,396

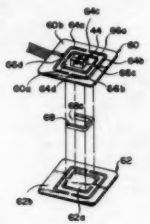
DOUBLE GIMBAL MAGNETIC HEAD SUPPORTING MECHANISM FOR A FLOPPY DISK DRIVE

Yushi Kawasaki, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,554
Claims priority, application Japan, Dec. 19, 1986, 61-303035
Int. Cl.[4] G11B *5/48, 21/16*
U.S. Cl. 360—104 **4 Claims**

1. A magnetic head supporting mechanism having a carriage which is movable in the radial direction of a floppy disk, an arm provided rockably relative to said carriage and magnetic heads which are mounted on said carriage and said arm, respectively, and are brought into close contact with opposite surfaces of said floppy disk for reading/writing operation, said magnetic head supporting mechanism, characterized in that:

one of said magnetic heads is supported by one of said carriage or arm through a gimbal pair assembly in the state of being movable only vertically and restrained from inclining,



said gimbal pair assembly including a pair of biaxial gimbal springs with the outer-peripheries thereof fixed on said one of said carriage or said arm, and a spacer for fixing central portions of said pair of gimbal springs with a space therebetween and said one of said magnetic heads being mounted on the central portion of said gimbal pair assembly in a fixed state;

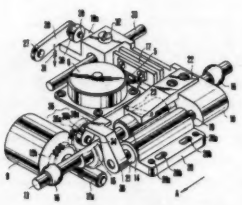
the other one of said magnetic heads is mounted on the other of said arm or said carriage through a biaxial gimbal spring.

4,841,397

HEAD SHIFTING DEVICE

Masaya Maeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 847,202, Apr. 2, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 148,131
Claims priority, application Japan, Apr. 4, 1985, 60-71732
Int. Cl.[4] G11B *5/54*
U.S. Cl. 360—105 **29 Claims**



1. A head shifting device in a recording or reproducing apparatus which changes a recording or reproducing position thereof from one position to another by shifting a recording or reproducing head in a radial direction of a disc-shaped flexible recording medium, said device comprising:

first means for shifting said head in the radial direction of said medium;

second means for repetitively moving said head toward and away from said recording medium as said head is shifted in said radial direction, said second means being arranged to shift said head to a position separated away from said recording medium when said head is shifted to change the recording or reproducing position from said one position to said another position; and

control means for controlling said first means so that said head is stopped at a position location between the adjacent recording or reproducing positions.

8. A head shifting device comprising:

first means for moving a head a predetermined distance in a predetermined direction along a surface of a recording medium;

second means for repetitively changing a distance between said head and the surface of said recording medium every predetermined distance said head is moved in the predetermined direction by said first means, said second means being arranged to separate said head away from the surface of said recording medium on the way of movement of said head when said head is moved by said first means in said predetermined direction by said predetermined distance; and

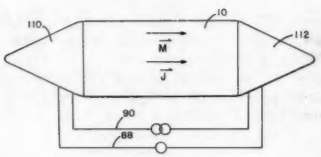
control means for controlling said first means so that the movement of said head in said predetermined direction stops at a position separated away from said recording medium when said second means moves said head to said position.

4,841,398

NON LINEAR MAGNETORESISTIVE SENSOR

Greg S. Mowry, Burnsville, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Feb. 17, 1987, Ser. No. 15,200
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **1 Claim**



1. Apparatus comprising:

a magnetoresistive sensor mounted in a recording head adjacent a magnetic recording medium comprising:

a sense region having a magnetization vector M aligned parallel to the easy axis in the absence of external magnetic fields from said recording medium;

means for providing a sense current in the sense region having a vector J substantially parallel with said easy axis magnetization vector M;

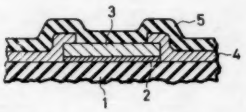
said magnetic recording medium mounted adjacent to said head such that relative motion between them can occur; the magnetic medium having a plurality of magnetization transitions recorded thereon providing magnetic flux pulses to the sense region as a transition passes the sensor, the peak flux amplitude of the pulse being sufficient to rotate the sense region magnetization vector M away from the sense current vector J so that the angle between them is in the range of 40 to 50 degrees, whereby the sensor operates in a non linear mode because of the initial alignment of sense current and magnetization vectors in absence of magnetic flux from the magnetic medium, and wherein the sensor's response in the region of the pulse peak from magnetic flux from the magnetic medium is approximately a linear function of magnetic flux of the transition.

4,841,399

MAGNETORESISTIVE MAGNETIC HEAD INCLUDING ZIRCONIUM SHEET FILM

Masahiro Kitada, Tokyo; Noboru Shimizu, Tokorozawa; Hideo Tanabe; Hitoshi Nakamura, both of Tokyo; Tetsuo Kobayashi, Kanagawa; Tooru Takeura, Odawara, and Kazuhiro Momata, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1986, Ser. No. 936,617
Claims priority, application Japan, Nov. 29, 1985, 60-267111
Int. Cl.[4] G11B *5/30*
U.S. Cl. 360—113 **10 Claims**



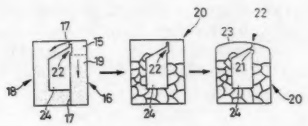
1. A magnetoresistive magnetic head comprising a two-layer film structure consisting of i) a magnetoresistive film comprised of a Ni-Fe alloy film containing 7 to 27 wt % of iron and substantially the balance of nickel and ii) a shunt film comprised of a zirconium film.

4,841,400

MAGNETIC HEAD CORE COMPRISING A MONOCRYSTALINE FERRITE

Soichiro Matsuzawa, Kuwana, Japan, assignor to NGK Insulators, Ltd., Tokyo, Japan

Division of Ser. No. 683,491, Dec. 19, 1984, Pat. No.
Claims priority, application Japan, Dec. 27, 1983, 58-246262
Int. Cl.[4] G11B *5/133, 5/127*
U.S. Cl. 360—125 **6 Claims**



1. A magnetic head core comprising:

a generally ring-shaped ferrite which forms a generally annular magnetic circuit, said core having a magnetic gap of a predetermined width formed transversely across the annulus of the magnetic circuit;

said magnetic circuit consisting of a plurality of respective core elements of ferrite butted together in contacting engagement into a generally ring-shaped assembly and bonded together at mutually abutting surfaces by means of a solid-solid reaction;

opposed end portions of said respective core elements define said magnetic gap therebetween and provide contacting surfaces with which a magnetic recording medium is slidably contacted and are formed from a single crystal of ferrite; and

one of said plurality of core elements originally being a block of polycrystalline ferrite having a partially monocrystalline portion consisting of a ferrite single crystal with said respective opposed end portion including said monocrystalline portion, another of said plurality of core elements having said respective opposed end portion being originally polycrystalline and being monocrystallized as a result of growth of said ferrite single crystal of said monocrystalline portion of said one of said plurality of core elements toward the originally polycrystalline portion of the opposed end portion of said another of said plurality of core elements.

4,841,401
AMORPHOUS MAGNETIC HEAD

Mitsuo Satomi; Akio Kuroe, both of Katano; Eisuke Sawai, Hirakata; Masaru Higashionji, Katano; Hiroshi Sakakima, Hirakata, and Kenji Kondo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

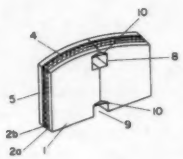
PCT No. PCT/JP84/00037, § 371 Date Oct. 9, 1984, § 102(e) Date Oct. 9, 1984, PCT Pub. No. WO84/03167, PCT Pub. Date Aug. 16, 1984

Continuation of Ser. No. 31,183, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 666,089, Oct. 9, 1984, abandoned. This PCT application Feb. 9, 1984, Ser. No. 224,215

Claims priority, application Japan, Feb. 10, 1983, 58-20623

Int. Cl.[4] G11B *5/127*

U.S. Cl. 360—125 9 Claims



1. In a magnetic head having a magnetic core comprising a first substrate of non-magnetic material, at least one layer of an amorphous magnetic alloy material directly formed on said first substrate, and a second substrate of non-magnetic material bonded to said layer of amorphous magnetic alloy material by a bonding glass layer formed of a glass material containing lead and having a low melting point, the improvement of means for preventing deterioration of said bonding glass layer and resultant weakening of adhesion of the bond between said second substrate of non-magnetic material and said layer of amorphous magnetic alloy material, said means comprising:

a layer of non-magnetic ceramic material, separate from said bonding glass layer, between said layer of amorphous magnetic alloy material and said bonding glass layer, said non-magnetic ceramic layer having a thickness δ defined by $2000\ \text{Å} < \delta \leqq 5000\ \text{Å}$.

4,841,402
THIN FILM MAGNETIC HEAD AND METHOD OF MANUFACTURE

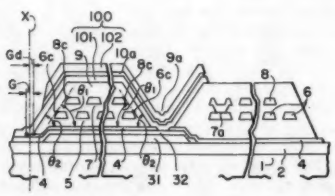
Tadashi Imanaka; Masayuki Takagi; Eisei Togawa; Harunobu Saito; Sadanori Nagaike; Masaki Ohura, all of Odawara; Saburo Suzuki, Minamiashigara; Tetsuo Kobayashi, Ashigarakami, and Shunichiro Kuwatsuka, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,623

Claims priority, application Japan, Jan. 27, 1986, 61-13807

Int. Cl.[4] G11B *5/12, 5/30*

U.S. Cl. 360—126 9 Claims



1. A thin film magnetic head comprising:

a substrate (1) having a planar surface;

a first magnetic member (30) formed on said substrate;

a non-magnetic gap layer (4) formed on said first magnetic member;

a first insulator member (5) formed on said gap layer;

a layer of a first conductor member (6) of spiral windings of electrically conductive material formed on said first insulator member and having an outer surface edge;

a second insulator member (7) formed on said first conductor member;

a layer of a secondcconductor member (8) of spiral windings of electrically conductive material formed on said second insulator member and having an outer surface edge, said second conductor member being electrically connected with said first conductor member to constitute a two-layered conductor coil;

a third insulator member (9) formed on said second conductor member; and

a second magnetic member (101) formed on said third insulator member arranged to extend on edges of said first, second and third insulator members along a straight line having a slope and on a portion of said gap layer and being in contact with said first magnetic member to constitute a magnetic path; wherein

the relative arrangement of said first and second conductor members (6, 8) within a space defined by said gap layer (4) and said second magnetic layer (101) is such that an angle θ_1 formed between a reference plane substantially parallel with the substrate surface and a line connecting the surface edges (6c, 8c) of the cross-sections of said first and second conductor members (6, 8) taken on a plane perpendicular to the substrate surface is substantially equal to an angle θ_2 formed between said reference plane and a side slope of said second magnetic member (101), and

each of said angles is in a range of from about 30° to 45°.

4,841,403
LID SPRING LOCKING STRUCTURE IN A MAGNETIC TAPE CASSETTE

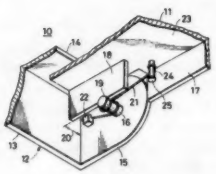
Masao Tsuruta; Seiji Kiuchi; Akira Honjyoh; Kengo Oishi, and Osamu Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 586,924, Mar. 7, 1984, abandoned. This application May 14, 1987, Ser. No. 51,220

Claims priority, application Japan, Mar. 7, 1983, 58-31509

Int. Cl.[4] G11B *23/02, 15/32*

U.S. Cl. 360—132 9 Claims



1. In a magnetic tape cassette in which an opening provided in the front part of a cassette body is covered by a guard panel (12), and in which supporting shafts (16) protrude from the inner surfaces of the side walls (15) of said guard panel near said opening, said guard panel being rotatable with respect to said cassette body to open and close said opening, and a coil spring (21) supported on each supporting shaft has a first end engaged with said guard panel urging said guard panel through a second end of said coil spring to rotate to close said opening, the improvement wherein the first end is engaged with a protrusion, integral with said guard panel, for detachably engaging the first end to said guard panel, and the second end of each coil spring is fixedly secured to looking means provided on an inner surface adjacent a side wall of an upper half of said cassette body so that said second end is stationary with respect

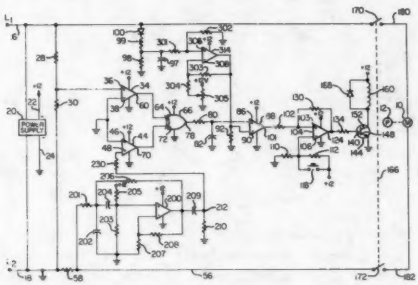
to said locking means regardless of rotation of said guard panel.

4,841,404

PUMP AND ELECTRIC MOTOR PROTECTOR

William W. Marshall, Centerville, and Lamar D. Springer, Spring Valley, both of Ohio, assignors to Spring Valley Associates, Inc., Dayton, Ohio

Filed Oct. 7, 1987, Ser. No. 106,048
Int. Cl.[4] H02H *5/00*
U.S. Cl. 361—30 **10 Claims**



5. The method of protecting a liquid pump which is operated by an electric motor to which alternating current electrical energy having a fundamental frequency is applied through a plurality of electric conductor members, and a switch operable to connect and to disconnect the electric motor with respect to the electric conductor members comprising:

providing a first voltage signal, the first voltage signal being related to the current flow through the electric conductor members and through the electric motor,

attentuating harmonic frequencies which exist in the first voltage signal,

providing a second voltage signal, the second voltage signal being related to the voltage of the alternating current electrical energy which is applied to the electric conductor members,

sensing the phase angle between the first voltage signal and the second voltage signal and obtaining a phase angle voltage signal proportional to the phase angle,

generating a third voltage signal in accordance with the amplitude of the voltage of the alternating current electrical energy which is applied to the electric conductor members, modifying the third voltage signal to obtain a fourth voltage signal which compensates for changes in phase angle which occur as a result of variations in the amplitude of the voltage of the alternating current electrical energy which is applied to the electric conductor members, comparing the phase angle voltage signal to the fourth voltage signal, and operating the switch when the difference between the phase angle voltage signal and the fourth voltage signal exceeds a predetermined magnitude.

4,841,405

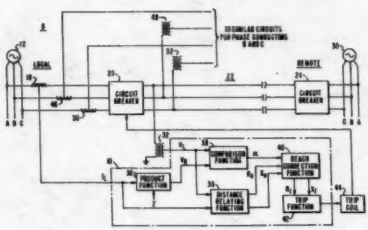
PROTECTIVE RELAYING APPARATUS FOR PROVIDING FAULT-RESISTANCE CORRECTION

Eric A. Udren, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 6, 1985, Ser. No. 709,235
Int. Cl.[4] H02H *3/34*
U.S. Cl. 361—80 **9 Claims**

1. Protective relay apparatus for use at a local end of a line segment of a transmission line in a power system network, said network including local and remote generating sources disposed at respective local and remote ends of said transmission line segment for rendering load flow conditions associated therewith, said relay apparatus operative in response to a fault along said transmission line to measure an apparent impedance corresponding to said fault in relation to the local end of said transmission line segment and to generate a signal representative thereof for use in determining the location of said fault along said transmission line, said apparent impedance measurement, at times, including an erroneous component caused by said load flow conditions of said transmission line segment interacting with a fault which contributes resistance substantially to the fault impedance of the transmission line, said erroneous component rendering the determination of an erroneous fault location, said protective relay apparatus comprising:

first means for generating a first signal indicative of the load flow conditions of said transmission line segment;



second means for generating a second signal representative of said erroneous component as a function of said first signal;

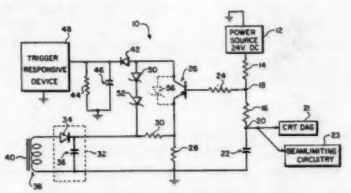
means for compensating said apparent fault impedance signal as a function of said second signal, a predetermined impedance characteristic of a transmission line segment, and an apparent fault impedance signal to generate a compensated fault impedance signal, thereby providing a fault impedance measurement for the determination of a better estimate of the fault location along the transmission line.

4,841,406

X-RADIATION PROTECTION CIRCUIT

Willy F. Stierberger, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

Filed Sep. 28, 1987, Ser. No. 101,878
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **8 Claims**



1. In a television having a cathode-ray tube producing an electron beam, a high voltage transformer for providing a high voltage potential, and an electron beam power source for providing an electron beam current to the tube, a protective circuit comprising:

first detector means interconnected with the electron beam power source for monitoring the electron beam current therefrom and for continuously producing a first voltage proportional in magnitude to the electron beam current;

second detector means interconnected with the high voltage transformer for monitoring the high voltage transformer therefrom and for continuously producing a second voltage proportional in magnitude to the high voltage potential; and

a monitoring circuit constantly receiving the first and second voltages for constantly monitoring the additive sum of the first and second voltages and for producing a trigger signal when the additive sum of said first and second voltages exceeds a selected magnitude, whereby a trigger signal indicates an excessively high combination of electron beam current and high voltage potential.

4,841,407

MAGNETIC FIELD GENERATOR HAVING A PLURALITY OF COILS FOR GENERATING MAGNETIC FIELD IN SUBSTANTIALLY THE SAME SPACE AND METHOD OF DRIVING THE SAME

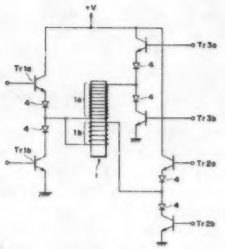
Hisatoshi Baba; Naoki Imokawa, and Makoto Shiho, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 60,303

Claims priority, application Japan, Jun. 16, 1986, 61-138346; Dec. 24, 1986, 61-306221; Dec. 24, 1986, 61-306222

Int. Cl.[4] H01H *47/00, 47/26*

U.S. Cl. 361—146 **11 Claims**



1. A bias magnetic field generator for an optomagnetic information recording apparatus comprising:

a first coil group, including at least one coil, for generating a magnetic field upon energization;

a second coil group, including at least one coil, and arranged such that a magnetic field is generated in substantially the same space as that of the magnetic field generated by said first coil group, a self-inductance of said second coil group being smaller than that of said first coil group; and

driving means for selectively energizing said first and second coil groups, said driving means energizing said second coil group first, and when the magnetic field intensity of said second coil group reaches a predetermined value, energizing said first coil group, thereby keeping the magnetic field intensity at the predetermined value.

4,841,408

ELECTROCONDUCTIVE SLIDING APPARATUS

Shigeki Matsunaga, Tokyo; Yuichi Ishikawa, Yokohama, and Masachi Hosoya, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 111,674

Claims priority, application Japan, Oct. 31, 1986, 61-258550; Dec. 26, 1986, 61-308893; Jun. 15, 1987, 62-146862

Int. Cl.[4] H05F *3/02*

U.S. Cl. 361—220 **28 Claims**

1. An electroconductive sliding apparatus including:

(a) a first electroconductive member rotatively supported by at least one bearing;

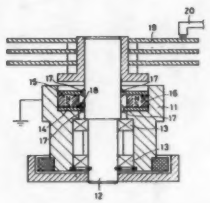
(b) a second electroconductive member supported by said bearing for relative movement with said first electroconductive member and defining a slidable point therebetween;

(c) an electroconductive slider at said slidable point for sliding upon said first member to provide for the grounding of static electricity from said first member to said second member in order to avoid static electricity spark between said members;

(d) means to apply a force to said electroconductive slider to push the same against said second member;

(e) a lubricating magnetic fluid interposed between said first and said second electroconductive members in order to lubricate said slidable point between said electroconductive slider and said second member;

(f) means to produce a magnetic force between said first electroconductive member and said second electroconductive member to keep said magnetic fluid at said slidable point and to form a magnetic field around said slidable point;



whereby said slidable point is characterized by the existence of said magnetic fluid to be contactingly slided or to be floatingly slided at a distance capable of providing electroconductive grounding between said first electroconductive member and said second electroconductive member and being lubricated by said magnetic fluid.

4,841,409

METHOD OF MANUFACTURING A CORONA DISCHARGE ELECTRODE AND A CORONA DISCHARGE ELECTRODE PRODUCED BY THE METHOD

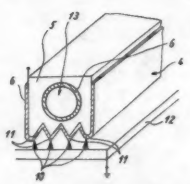
Klaus Kalwar, Alte Landwehr 10, 4803 Steinhagen, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 127,280

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640966; Nov. 29, 1986, 8632118[U]

Int. Cl.[4] H01T *19/04;* **F27B** *9/04*

U.S. Cl. 361—230 **13 Claims**



1. A corona discharge electrode comprising a core of at least partially electrically graphite material, a dielectric layer of a ceramic material coating at least a corona discharge surface of said core, said ceramic material being substantially of an oxide free ceramic having a density of at least 95% of theoretically attainable density.

4,841,410

METHOD OF ACCOMMODATING AN OBJECT WHICH CARRIES CURRENT DURING OPERATION IN A SYNTHETIC RESIN HOUSING AND A COMBINATION OF AN OBJECT WHICH CARRIES CURRENT DURING OPERATION AND A SYNTHETIC RESIN HOUSING

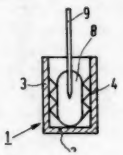
Andries C. Maijers; Johannus W. Weekamp; Antonius C. J. C. Van Den Ackerveken, and Jan Brink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,419

Claims priority, application Netherlands, Nov. 6, 1986, 8602805

Int. Cl.[4] H05K *1/04;* H05F *3/02*

U.S. Cl. 361—306 8 Claims



5. A combination of an open synthetic resin housing comprising a bottom wall portion and a continuous side wall portion extending upwardly from said bottom wall portion, said bottom wall portion and said wall position defining an open space for accommodating an electrical element provided with two leads extending outwardly from said housing in the same general direction from two opposing ends of said element and said element positioned in said space, the leads of said element projecting outwardly from said space away from said bottom wall portion and said space being filled by a cured synthetic resin characterized in that in the vicinity of each of the ends of said element from which said leads extend, a resilient, member which partially surrounds said element, contacts portions of said element between said ends and away from said leads and is provided between said side wall portion of said housing and walls of said element facing said side wall portion, said resilient member comprising two legs, each leg being situated between said element and portions of said side wall portion facing said element and each leg comprising angled portion comprising at least two vertices, at least one of which vertices engages against the element and at least one of which vertices engages against said side wall portion of said housing.

4,841,411

ELECTRICAL CAPACITORS HAVING LOW CAPACITANCE TOLERANCES AND METHOD FOR THE MANUFACTURE THEREOF

Hartmut Kessler, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 187,962

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715810

Int. Cl.[4] H01G *1/015, 13/00*

U.S. Cl. 361—323 23 Claims

1. An electrical capacitor, comprising:

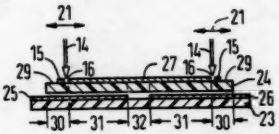
a stack of at least two dielectric plies of plastic;

regenerably thin metal coats on at least one side of said at least two dielectric plies;

metal-free insulating strips provided on said at least two dielectric plies in alternation from ply to ply in proximity to different edge sides and at a distance therefrom;

metal layers applied to said edge sides to contact said metal coats with opposite polarity from ply to ply;

overlap of said metal coats being modified from a rated overlap of said metal coats in accordance with an equation $C=\epsilon\epsilon_o$ nL $(u+\Delta u)/(d+\Delta d)$ to compensate for fluctuations from a prescribed rated thickness of said dielectric plies, where C is the capacitance of the capacitor, ϵ is the dielectric constant of the dielectric material used, ϵ_o is the dielectric constant of a vacuum, n is the number of plies of



the film capacitor situated on top of one another, L is the length of the film capacitor defined by a parting cut, u is the lateral rated overlap, Δu is the modification of the lateral rated overlap, d is the rated dielectric thickness and Δd is the fluctuation of the rated dielectric thickness.

4,841,412

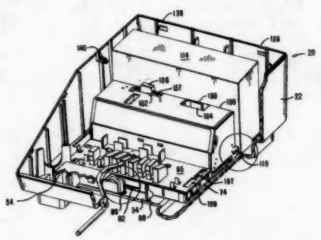
ELECTRONIC APPARATUS ASSEMBLY

George Heys, Jr.; Andrew E. Yandora, and Philip D. McDowell, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1988, Ser. No. 212,839

Int. Cl.[4] G06F *1/00*

U.S. Cl. 361—393 21 Claims



1. An electronic terminal device comprising:

a combined base and wall structure for said terminal device, said wall structure including two side walls, a front wall and a rear wall, said side walls each having an inclined portion extending upwardly from said front wall to a point and a horizontal portion extending from said point to said rear wall;

a top member positioned on the horizontal portions of the side walls and on the rear wall;

a keyboard module positioned over the inclined portions of the side walls and over the front wall;

a power supply having a housing positioned on said base within said terminal adjacent said rear wall;

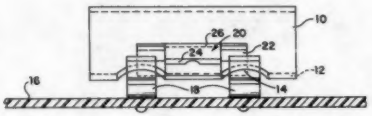
an electronics assembly positioned within said terminal adjacent said power supply and provided with a plurality of extensions which engage apertures in the housing of said power supply and retain said electronics assembly and said power supply in position and provide electrical connection between said power supply and said electronics assembly; and

resilient securing means releasably retaining said electronics assembly in position on said base within said terminal device.

4,841,413
SNAP ON FUSE COVER

Dennis S. Mizerak, Brunswick, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 11, 1987, Ser. No. 96,174
Int. Cl.[4] H05K 7/06
U.S. Cl. 361—400 5 Claims

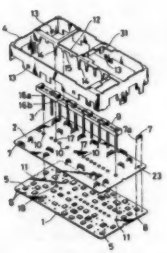


1. A fuse cover combination comprising a board, a pair of fuse engaging clips spaced apart from each other and connected to said board, a fuse mounted between said clips, and a fuse cover engaged over said fuse and fuse clips, said fuse cover comprising a transparent resilient tubular member having opposite open ends and an axial length which is greater than a length encompassing said fuse and fuse clips, said tubular member having an axially extending slot to permit said tubular member to engage on opposite sides of said fuse clips.

4,841,414
HIGH FREQUENCY APPARATUS CHASSIS AND CIRCUIT BOARD CONSTRUCTION

Eiichi Hibino; Kiyoshi Kawakita; Takami Yamamoto; Kazunori Kinoshita, and Shigeki Takase, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 145,644, Jan. 13, 1988, abandoned, which is a continuation of Ser. No. 437,223, Dec. 31, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 267,658
Claims priority, application Japan, Dec. 3, 1985, 60-186442[U]
Int. Cl.[4] H05K 5/04; H04B 1/08
U.S. Cl. 361—424 17 Claims



15. A high frequency apparatus construction comprising:

a printed circuit base plate having first and second main surfaces opposed to each other, and a plurality of first apertures extending therethrough at right angles to said first and second main surfaces; said base plate including circuit pattern on at least said second main surface;

a chassis which defines a top surface plane, said chassis receiving said base plate;

fixing means fixing said base plate in said chassis;

positioning means fixedly provided on said chassis and defining a predetermined spacing between said top surface plane of said chassis and the first main surface of said base plate;

a plurality of external connection lead terminals inserted in said plurality of first apertures to extend away from said top surface plane and below said base plate; and soldered to said circuit pattern; and

a terminal holder made of insulation material and fixedly retaining said plurality of external connection lead terminals, said terminal holder being positioned by being clamped between said first main surface of said base plate and said positioning means;

wherein said chassis is formed from a single metal plate which is punched and shaped in such a manner that it has four side walls depending at right angles to said top surface plane and said first and second main surfaces of said base plate and successively connected together, said chassis having a shield plate thereon and defining said top surface plane, and said positioning means is formed at least in part by a depending portion of said shield plate;

wherein said depending portion of said shield plate extends at right angles to said first main surface of said base plate and has a predetermined length, and said positioning means is formed by at least a portion of the depending portion of said shield plate opposed to said first main surface for spacing said base plate from said top surface plane at least by said predetermined length;

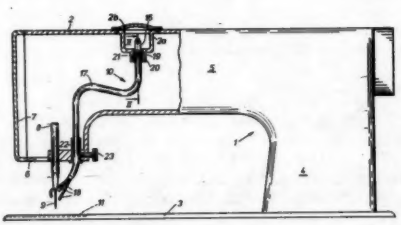
wherein said shield plate is formed with guide projections extending from said depending portion at positions where they do not interfere with said plurality of external connection lead terminals, and wherein said base plate is formed with second and third apertures receiving said guide projections, the latter being soldered to said circuit pattern on said second main surface of said base plate; and

wherein said plurality of external connection lead terminals, said depending portion of said shield plate, and said guide projections are positioned in substantially the same plane and engage respective portions of said terminal holder.

4,841,415
APPARATUS FOR LIGHTING A SEWING AREA OF A SEWING MACHINE

Reinhold Dobner, Kaiserslautern, Fed. Rep. of Germany, assignor to G. M. Pfaff, AG, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,769
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 8703621
Int. Cl.[4] D05B 79/00
U.S. Cl. 362—90 10 Claims



1. A lighting device for a sewing machine having a housing with a base, an upright portion mounted on the base and an arm portion carried by the upright portion overlying the base and with a needle carried by the arm portion for movement to effect sewing over the base portion, comprising a light source carried on said housing, a flexible sheath supported in the arm portion and extending outwardly of the arm portion in a vicinity of the needle, at least two light guides in said sheath having first ends exposed to said light source and opposite second ends extending out of said sheath in the vicinity of the needle, said sheath being bendable and each of said light guides being bendable independently so as to arrange said second ends, extending out of said sheath, to illuminate effective areas in the vicinity of said needle.

4,841,416

SOLAR CHARGING LAMP

Todd Doss, 1540 Alfred La. #D, Yuba City, Calif. 95991

Filed Mar. 2, 1988, Ser. No. 162,883
Int. Cl.[4] F21S *9/00*
U.S. Cl. 362—183 **1 Claim**

1. A solar charging lamp post comprising,

a vertical housing means including a transparent globe protectively containing an illumination bulb therein secured to an upper terminal end of said housing means, and

photo-voltaic cell means for collecting and converting solar energy to direct current electrical energy, and

a direct current storage battery secured within a battery housing means operatively associated with said photo-voltaic cell means for accepting and storing said electrical energy from said photo-voltaic cell means, and

further housing means secured to said vertical housing means for storage of a length of electrical cord formed with an adaptor at one end thereof operatively associated with said photo-voltaic cell means for selective electrical association with an automobile for providing electrical energy to a storage battery within said automobile, and

wherein said illumination bulb is a direct current bulb of a wattage range of ten to twenty watts, and

wherein said photo-voltaic cell means are secured to brackets on said vertical housing means wherein said vertical means is cylindrical and said bracket means include a plurality of brackets diametrically opposed proximate said upper terminal end of said vertical housing means, and

wherein said globe is of polyhedral configuration formed with an upper surface wherein said upper surface has positioned thereon said photo-voltaic cell, and

wherein said battery housing means is secured to a lower terminal end of said vertical housing means for providing stability to the solar charging lamp post, and

wherein a photo-cell is operatively associated with said bulb for enabling illumination of said bulb during periods of darkness, and

wherein infra-red movement sensor is operatively associated with said photo-electric cell further including switch means for disengaging said cell and providing switching of said bulb through said infra-red movement sensor for illuminating said bulb upon sensing movement proximate said sensor.

4,841,417

TAILCAP SWITCH-FOCUS FLASHLIGHT

Anthony Maglica, Ontario; Robert J. DeLong, Temple City, and Armis L. Lewis, Cucamonga, all of Calif., assignors to MAG Instrument, Inc., Ontario, Calif.

Filed Oct. 7, 1987, Ser. No. 106,064
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—206 **16 Claims**

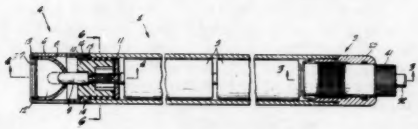
1. A flashlight comprising:

a barrel for retaining one or more dry cell batteries;

a head assembly positioned at one end of the barrel and containing a lens, a reflector and a lamp having a positive contact and a ground contact;

means for electrically coupling the positive contact of the lamp to a first battery electrode and the ground contact of the lamp to a second battery electrode;

means for switching the electrical circuit on or off which includes a tail cap, an outer housing rotatably positioned



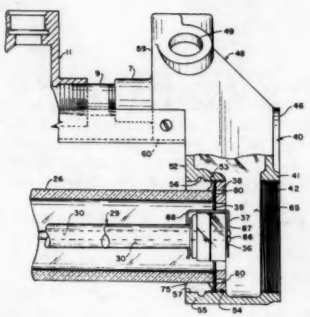
within the tail cap, an inner housing positioned within the outer housing, an electrical contact, and means for making and breaking electric contact between the second electrode and the contact, said means being positioned at a second end of the barrel, and at said same second end means for moving the lamp relative to the reflector and thereby adjusting the focus of the light emitting through said lens of the flashlight.

4,841,418

EXPLOSION-PROOF FIXTURE AND METHOD

Dwayne Davis, Lee County, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 21, 1987, Ser. No. 87,760
Int. Cl.[4] F21Y *15/00*
U.S. Cl. 362—223 **14 Claims**



1. An explosion-proof fixture comprising an end housing, said end housing having inner and outer walls defining a chamber, openings in said inner and outer walls, a light transmitting sleeve having an open end mounted in said inner wall opening, said sleeve being slideable through said openings and mountable and demountable therethrough, a lamp mounted within said sleeve, said lamp having socket means on an end thereof, retaining means on said inner wall, and bracket assembly means, connected to and supported by said retaining means, for mounting said lamp within said sleeve.

4,841,419

LAMP ASSEMBLY HAVING A SNAP-ON CONNECTOR FOR READY MOUNTING AND DISMOUNTING OF A LIGHT BULB TO AND FROM A LAMP HOUSING

Kazutami Ohishi, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Japan

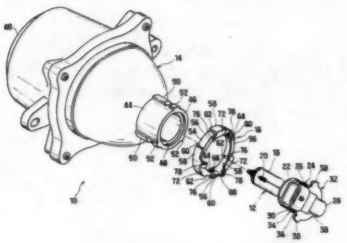
Filed Jul. 18, 1988, Ser. No. 220,691
Claims priority, application Japan, Jul. 20, 1987, 62-180239
Int. Cl.[4] H01J *5/48*
U.S. Cl. 362—226 **6 Claims**

1. An electric lamp assembly of the type having a light bulb

including a base with a flange formed thereon, the flange having a plurality of lugs extending radially outwardly therefrom, and a lamp housing for accomodating the light bulb, the lamp housing having a mounting tube extending therefrom to terminate in a bulb entrance end through which the light bulb is inserted in the lamp housing until the base of the light bulb becomes received in the mounting tube, the mounting tube having first engagement means formed thereon, wherein the improvement resides in a snap-on connector for permitting the light bulb to be readily mounted to and dismounted from the lamp housing after said snap-on connector has been mounted on said mounting tube by a rotational movement of said snap-on connector, the sna;-on connector comprising:

(a) a substantially annular body;

(b) locking second engagement means formed adjacent one axial end of the annular body, the second engagement means being locklingly engageable with the first engagement means on the mounting tube of the lamp housing by rotation of said snap-on connector for lockingly mounting the annular body on the bulb entrance end of the mounting tube; and



(c) a plurality of retainer lips extending radially inwardly from the other axial end of the annular body and each defining a space for accommodating one lug on the flange of the light bulb between itself and the bulb entrance end of the mounting tube, each retainer lip having first and second opposite ends in the circumferential direction of the annular body, at least the first circumferential end of each retainer lip being open for insertion of one lug on the light bulb flange;

(d) whereby the light bulb can be mounted to the lamp housing via the snap-on connector by first inserting the light bulb in the bulb entrance end of the mounting tube, then by inserting the lugs on the light bulb flange in the open first circumferential ends of the retainer lips of the snap-on connector until the lugs become held against the bulb entrance end of the mounting tube, and then by turning the light bulb relative to the lamp housing and the snap-on connector until the lugs on the light bulb flange become received in the spaces between the retainer lips of the snap-on connector and the bulb entrance end of the mounting tube.

4,841,420

STRING LIGHTS FOR CONSTRUCTION SITES

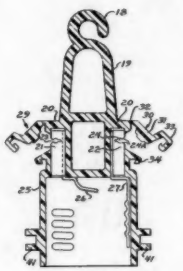
Horacio A. Baggio, Niles, and George R. Eckart, Evanston, both of Ill., assignors to Woodhead Industries, Inc., Northbrook, Ill.

Filed Jun. 20, 1988, Ser. No. 209,322

Int. Cl.[4] F21V *15/02*

U.S. Cl. 362—249 **7 Claims**

1. A plurality of string lights adapted to be hung on a common messenger wire at spaced intervals to provide light for an area, each of said string lights comprising: a lampholder defining mean for attaching to said messenger wire and a socket for receiving a lamp, said lamp holder further including first and second electrical connector means for attaching to electrical power feed lines to energize a lamp received in said socket; means defining a peripheral retainer flange on the exterior of said socket; and a lamp guard comprising first and second similar lamp protectors, each lamp protector including an upper collar defining a groove for coupling to a portion of said retainer flange on said socket and a hinging coupling member at one end of said collar and including a connecting element,



the other end of said collar extending laterally outwardly and defining a slot for receiving an associated connecting element of an adjacent lamp protector, said lamp protector further including a cage guard and a hinge extending from said collar to said cage guard to permit said cage guard to swing outwardly and upwardly relatively to said collar, and releasable snap coupling means for coupling to an associated cage guard at a location remote from said collar.

4,841,421

HOUSING FOR LONG-FIELD LAMPS HAVING INTERCHANGEABLE LOUVER INSERT

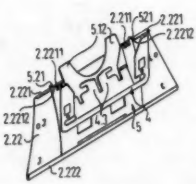
Gottfried Mueller, Traunwalchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,190

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1988, 8800431[U]

Int. Cl.[4] F21V *17/02*

U.S. Cl. 362—279 **4 Claims**



1. A housing for long-field lamps having an interchangeable louver insert whereby at least one lock is provided for the mutual, releasable interlocking of the housing and louver insert, said lock having a U-shaped carrier with two free legs and a spring arm extending between said legs in the direction toward the free ends thereof, whereby said lock, further, has its free legs secured to at least one housing face wall at the inside and the spring arm, whose free end is shaped as a gripping surface having latch shoulders offset relative thereto at both sides, describes an acute angle with said legs, and whereby, upon insertion of said louver insert into said housing, the gripping surface of the spring arm slides across the upper edge of that end louver lamella of the louver insert that is proximate to said spring arm and the latch shoulders of the spring arm engage in locking fashion under bent-off upper edge parts of

this end louver lamella that represent a counter-latch, comprising the louver insert being interchangeable with at least one other louver insert that has substantially high louver lamellae and, a plate-shaped lock adapter of resilient material being secured to that end louver lamella of this other louver insert that is proximate to the lock being secured thereto at that side facing toward the lock and between the upper and lower bent-off edges of said end louver lamella, the gripping surface of the lock being lengthened beyond the upper lamella edge by said lock adapter and said lock adapter representing the counter-latch for the lock.

4,841,422

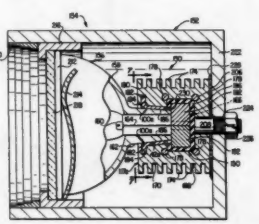
HEAT-DISSIPATING LIGHT FIXTURE FOR USE WITH TUNGSTEN-HALOGEN LAMPS

Allen R. Groh, Roanoke, Tex., assignor to Lighting Technology, Inc., Roakoke, Tex.

Division of Ser. No. 68,560, Jun. 30, 1987, Pat. No. 4,780,799, which is a continuation-in-part of Ser. No. 922,152, Oct. 23, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 203,807

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—294 **7 Claims**



1. Heat dissipating electrical connector apparatus comprising:

a cooling body having first and second spaced sections formed from a thermally and electrically conductive material adapted to receive electrical power from a source thereof, said cooling body further having a socket opening extending inwardly through a front end portion thereof and having an interior side surface and an inner end, said socket opening being adapted to receive a lamp element base portion having connector pins thereon, said first and second sections of said cooling body each having a pin opening formed therein which extends rearwardly from said inner end of said socket opening and is adapted to receive one of said connector pins;

a thermally conductive, electrically resistive material encapsulating and separating said first and second spaced sections of said cooling body; and

heat conducting material disposed along said interior side surface of said socket opening and adapted to be compressed between said interior side surface and a lamp base portion inserted into said socket openings.

4,841,423

ADDITIONAL HEADLIGHT FOR USE ON A MOTOR VEHICLE IN CONJUNCTION WITH A DIPPED HEADLIGHT

Bernard Luciani, Paris, France, assignor to Cibie Projecteurs, Bobigny Cedex, France

Filed Jun. 15, 1987, Ser. No. 62,214

Claims priority, application France, Jun. 17, 1986, 86 08722

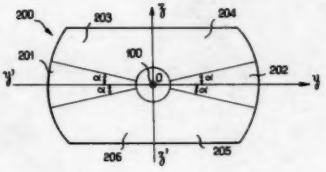
Int. Cl.[4] F21V *7/09*

U.S. Cl. 362—304 **6 Claims**

1. A motor vehicle headlight suitable for emitting a light beam which is essentially complementary to a dipped beam having a cutoff so that together the two beams constitute a main beam, the headlight comprising an axial filament lamp, a reflector and a closure glass, the headlight including the improvements whereby:

the filament of the lamp emits freely in all directions thereabout;

the reflector comprises two first sectors which are paraboloid in shape, which have a common focus situated approximately in the middle (in the axial direction) of the filament and a common axis of revolution which defines the axis of the headlight, said first sectors being delimited



by half-planes that are inclined on either side of substantially horizontal plane passing through the axis of the headlight in order to create a spot of light concentration in the vicinity of said headlight axis, and two other sectors which interconnect said first sectors with continuity and which are shaped such that the major part of each filament image produced thereby lies above a cutoff that substantially coincides with the cutoff of the dipped beam; and certain zones of the closure glass include means for distributing the beam horizontally.

4,841,424

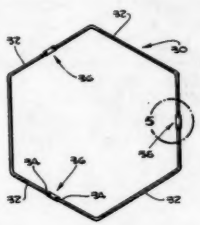
KNOCKDOWN RING FRAME FOR LAMP SHADE

Franz K. Weber, Belmont Shore, Calif., assignor to Modulite Corporation, Compton, Calif.

Filed May 31, 1988, Ser. No. 200,546

Int. Cl.[4] F21V *1/06*

U.S. Cl. 362—352 **12 Claims**



1. A knockdown ring frame for a lamp shade, comprising:

at least two rigid, elongated rods, each having opposite ends and formed to lie in a common plane and rigidly interconnect end-to-end to form a closed, planar ring, each said rod having a straight portion at each said end, each said portion having a transversely-extending tang formed thereon and spaced inwardly from a respective end; and

at least two connector sleeves, each having open, opposite ends and a straight segment at each said open end adapted to slidably receive an end of one of said rods coaxially therein, each said segment having a detent therein spaced inwardly from a respective end of said sleeve adapted to receive one of said tangs in locking, over-center engagement.

4,841,425

HIGH-VOLTAGE POWER SUPPLY APPARATUS

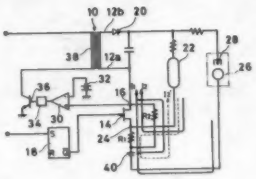
Yukio Maeba, and Kiyoteru Igashira, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 28, 1987, Ser. No. 55,188

Claims priority, application Japan, May 30, 1986, 61-83529[U]; May 30, 1986, 61-83530[U]

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **9 Claims**



1. A high-voltage power supply apparatus, comprising:

a transformer having an input winding and an output winding,

a series connection of a first resistor and a switching element, said series connection being connected between one end of said output winding and a reference potential,

a second resistor connected in parallel with said series connection,

a medium voltage circuit connected between the other end of said output winding and the reference potential,

a high voltage circuit connected in parallel with said medium voltage circuit,

control means for turning on said switching element and for controlling an input voltage of said input winding based on a current flowing through said first and second resistors, when said high voltage circuit is operated, and

for turning off said switching element and for controlling said input voltage of said input winding based on a current flowing through said second resistor, when said high voltage circuit is not operated.

4,841,426

METHOD FOR CONTROLLING THE SEMICONDUCTOR SWITCHES OF A RECTIFIER BRIDGE CONNECTED TO AN A.C. MAINS SUPPLY, AND A CONTROL UNIT DESIGNED FOR APPLYING THE METHOD

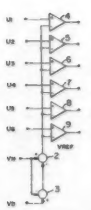
Harri Hakala, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland

Filed Dec. 18, 1987, Ser. No. 135,111

Claims priority, application Finland, Jan. 13, 1987, 870119

Int. Cl.[4] H02M *5/458*

U.S. Cl. 363—37 **6 Claims**



1. A method of controlling inverting semiconductor switches connected in parallel with rectifying components (D_7–D_{12}) of a rectifier bridge connected to an a.c. supply network, comprising the steps of:

forming a reference voltage (V_{REF}) comprised of a first voltage (V_N) proportional to a phase voltage having the highest absolute value and a second voltage (V_D) proportional to a rectified voltage from said rectifier bridge; and

controlling each of said semiconductor switches (Q_7–Q_{12}) by comparing a voltage (U_1–U_6) proportional to a phase voltage to said reference voltage (V_{REF}).

4,841,427

CAPACITIVE VOLTAGE LOWERING CIRCUIT WITH DUAL OUTPUTS

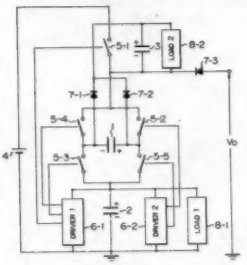
Hideki Miyazaki; Kenichi Onda, and Yasuo Matsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,134

Claims priority, application Japan, Jul. 1, 1987, 62-162353; Nov. 24, 1987, 62-294148

Int. Cl.[4] H02M *3/06*

U.S. Cl. 363—62 **6 Claims**



1. A power supply circuit comprising:

first charge storing means;

second and third charge storing means supplying their charged voltages so as to be used as sources of predetermined voltages applied to associated loads respectively;

switch means capable of selectively establishing at least a first mode and a second mode, so that, in said first mode, said first and second charge storing means are connected in series with a d.c. power source to be charged by a power supply voltage, while, in said second mode, said first charge storing means is electrically isolated from said d.c. power source and said second charge storing means, and said third charge storing means is connected to said first charge storing means in a closed circuit to be charged by the charges stored in said first charge storing means; and

a drive circuit driving said switch means so that said switch means repeats an operation cycle including at least said first mode and said second mode executed in that order.

4,841,428

NON-SATURATING MAGNETIC AMPLIFIER CONTROLLER

Robert D. Washburn, Malibu, and Robert F. McClanahan, Valencia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 18, 1988, Ser. No. 169,921

Int. Cl.[4] H02P *13/04*

U.S. Cl. 363—75 **14 Claims**

1. A magnetic amplifier comprising:

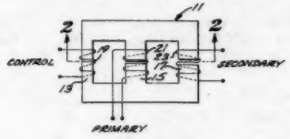
a magnetic core having a primary leg, a secondary leg, and a control leg;

a primary winding disposed about said primary leg of said magnetic core for generating a magnetic AC flux in said magnetic core;

a secondary winding disposed about said secondary leg of said magnetic core; and

a control winding disposed about said control leg of said

magnetic core for controlling the reluctance of said control leg relative to the reluctance of said secondary leg,



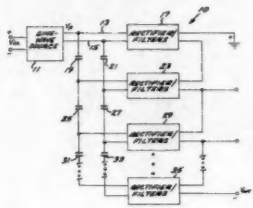
said control being provided without driving said magnetic core into saturation.

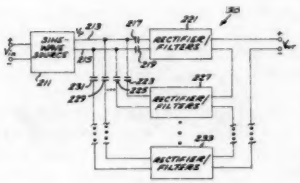
4,841,429

CAPACITIVE COUPLED POWER SUPPLIES

Robert F. McClanahan, Valencia; Robert D. Washburn, Malibu; Carlos H. Gonzalez, Norwalk; Jerry C. Sze, San Francisco, and David M. Lusher, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 24, 1988, Ser. No. 173,223
Int. Cl.[4] H02M *7/06*
U.S. Cl. 363—126 **7 Claims**





1. A power supply comprising:

means for providing AC power at a frequency greater than one megahertz;

non-resonant means responsive to said AC power for providing DC isolation and for providing capacitively coupled AC power without inductors or resistors; and

a plurality of rectifying means responsive to said capacitively coupled Ac power for providing respective DC outputs.

4,841,430

METHOD OF TEACHING A PATH TO A MOVING BODY

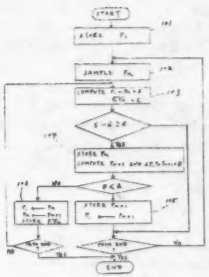
Toru Nakagawa; Hitoshi Kubota, and Yasuo Sakurai, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 5, 1986, Ser. No. 904,844
Claims priority, application Japan, Sep. 5, 1985, 60-196267
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—167.01 **19 Claims**

1. In a control system having a memory for controlling the movement of a moving part of a working apparatus so that said moving part is moved to trace a predetermined path, a method of successively obtaining tracing points on said path as path data for teaching said moving part to be moved substantially along said path by successive tracing of the tracing points, comprising the steps of:

(a) moving a position feeler along said path and monitoring the position of the feeler at first, second and third sampling points along said path;

(b) obtaining a difference between a path length and a



straight distance between the first and second sampling points on said path in response to the monitored positions at the first and second sampling points;

(c) determining a curvature of said path on the basis of an angle formed by said first and second sampling points and said third sampling point on said path in response to the monitored positions at the first, second and third points; and

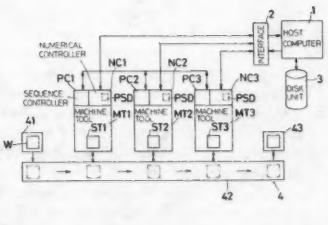
(d) selectively storing said first, second and third sampling points as said tracing points in said memory on the basis of the obtained difference and the determined curvature.

4,841,431

PROGRAMMABLE TRANSFER MACHINE

Masayoshi Takagi, Kariya; Yoshio Yoshioka, Anjo; Tetsuo Matsuzaki, Nishio; Shuhei Noro, Aichi; Syouji Ikawa, Okazaki, and Katutoshi Naruse, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 10, 1987, Ser. No. 72,142
Claims priority, application Japan, Jul. 10, 1986, 61-162659
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—187 **5 Claims**



1. A programmable transfer machine for processing plural workpieces, said workpieces moving through said transfer machine in only one direction, said machine comprising:

a plurality of machining stations;

a conveyor responsive to a transfer command signal applied thereto for simultaneously conveying workpieces to said machining stations successively only in said one direction

so that each of said workpieces is transferred from one of said machining stations to another machining station each time said conveyor is operated;

a plurality of numerically controlled machine tools respectively disposed at said machining stations, for respectively undertaking a series of machining operations which are to be performed on each of said workpieces, each of said machine tools being adapted to execute one or more machining programs assigned thereto, said machining operations undertaken by said machine tools;

means included in each of said machine tools for generating a trouble signal when the machine tool is in trouble;

program execution control means responsive to said trouble signal from each of said machine tools for causing a normal machine tool which is adjacent to said machine tool in trouble and at an upstream side of said conveyor, to execute one of said machining programs originally assigned to said machine tool in trouble in addition to another of said machining programs originally assigned to said normal machine tool;

detection means for issuing a completion signal when the executions of all of said machining problems by one or more remaining normal machine tools are completed; and

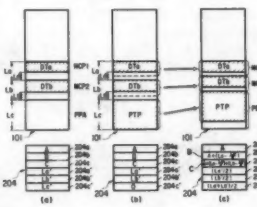
means for applying said transfer command signal to said conveyor so as to operate the same each time said completion signal is issued from said detection means.

4,841,432

METHOD OF RECONFIGURATION OF STORAGE AREAS IN AN APPARATUS FOR CHEATING NC TAPES

Hajimu Kishi, Hino; Takashi Takegahara, Hachioji, and Masashi Yukutomo, Sagamihara, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 444,591, Nov. 17, 1982, abandoned.
This application Jan. 19, 1988, Ser. No. 145,739
Claims priority, application Japan, Mar. 30, 1981, 56-047047
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—191 **9 Claims**



1. In an apparatus for automatically creating NC tapes for controlling machine tools wherein a memory is subdivided into plural storage areas, wherein each of the subdivided storage areas has the capability of being divided into a blank portion and a data portion, and wherein predetermined data are written into respective ones of the subdivided storage areas, a method of reconfiguring the subdivided storage areas of the memory comprising the steps of:

(a) discriminating whether a blank portion exists in a predetermined one of the subdivided storage areas;

(b) reducing, when there is no blank portion, or substantially no blank portion, in the predetermined one of the subdivided storage areas, the size of the blank portions of the remaining ones of the subdivided storage areas; and

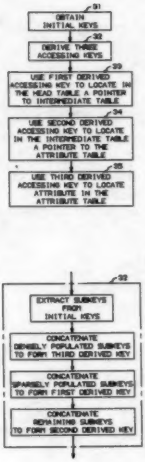
(c) enlarging the predetermined one of the subdivided storage areas by an amount equal to the amount of blank portion reduction effected in the remaining ones of the plural storage areas.

4,841,433

METHOD AND APPARATUS FOR ACCESSING DATA FROM DATA ATTRIBUTE TABLES

Shafik J. Hakim; Mark R. Locher, both of Naperville; Kenneth Y. Nieng, Lombard, and Barbara A. Vagnozzi, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 26, 1986, Ser. No. 935,247
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **12 Claims**


91
OBTAIN INITIAL KEYS
92
DERIVE THREE ACCESSING KEYS
93
USE FIRST DERIVED ACCESSING KEY TO LOCATE IN THE HEAD TABLE A POINTER TO INTERMEDIATE TABLE
94
USE SECOND DERIVED ACCESSING KEY TO LOCATE IN THE INTERMEDIATE TABLE A POINTER TO THE ATTRIBUTE TABLE
95
USE THIRD DERIVED ACCESSING KEY TO LOCATE ATTRIBUTE IN THE ATTRIBUTE TABLE

92
EXTRACT SUBKEYS FROM INITIAL KEYS
CONCATENATE DENSELY POPULATED SUBKEYS TO FORM THIRD DERIVED KEY
CONCATENATE SPARSELY POPULATED SUBKEYS TO FORM FIRST DERIVED KEY
CONCATENATE REMAINING SUBKEYS TO FORM SECOND DERIVED KEY

1. In a data base system for storing data attributes, said data base system comprising data tables comprising a head table and a plurality of tables of data attributes, each of said tables of data attributes comprising a plurality of slots, and wherein each of said data attributes is identified by a plurality of data accessing keys, a method of accessing data attributes in said plurality of tables of data attributes, comprising the steps of:

extracting at least two fixedly selected subkeys from different ones of said plurality of data accessing keys; and

deriving a first derived key for accessing one of said tables of said data base by combining data of said extracted subkeys;

wherein every slot of each of said tables of attributes corresponds to only one set of values of said plurality of data accessing keys.

4,841,434

CONTROL SEQUENCER WITH DUAL MICROPROGRAM COUNTERS FOR MICRODIAGNOSTICS

James K. Mathewes, Jr., Northborough; Jan S. Herman, Hollliston; Stephen C. Johnson, Waltham; Richard B. Goud, Concord, and Jack J. Stiffler, Hopkinton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

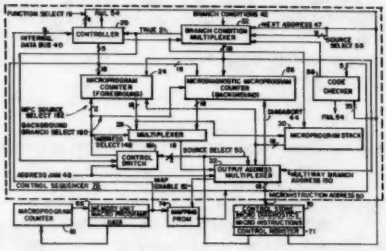
Continuation of Ser. No. 609,602, May 11, 1984, abandoned.
This application Apr. 27, 1987, Ser. No. 42,560
Int. Cl.[4] G06F *11/00, 9/22*
U.S. Cl. 364—200 **21 Claims**

1. A processing system for executing a stored primary program comprising:

memory means for storing a microinstruction secondary program and microinstructions for implementing macro-

instructions of said primary program, said secondary program being used for microdiagnostic testing;

control sequencer means coupled to said memory means and responsive to a macroinstruction of said primary program for enabling said processing system to execute said stored secondary program simultaneously with the execution of



said primary program without increasing said primary program execution time, said macroinstruction of said primary program being implemented by at least one of said microinstructions stored in said memory means; and

said control sequencer means comprises at least two microprogram counters for controlling the simultaneous operation of said primary program and said secondary program.

4,841,435

DATA ALIGNMENT SYSTEM FOR RANDOM AND BLOCK TRANSFERS OF EMBEDDED SUBARRAYS OF AN ARRAY ONTO A SYSTEM BUS

Robert L. Papenberg, San Jose, Calif., assignor to Saxpy Computer Corporation, Sunnyvale, Calif.

Filed Oct. 29, 1986, Ser. No. 924,912

Int. Cl.[4] G06F *12/00, 12/04, 12/06, 12/08*

U.S. Cl. 364—200 **7 Claims**

1. In a data transfer apparatus including a system memory (SMEM) having its storage elements organized into wide words (WW) having addresses A_{WW}, each WW consisting of W system words, with a location of each system word in a WW given by an offset (X), with each system word also identified by a system memory address, A_{SM}, and with the system memory having a data I/O port and a control port, said data transfer apparatus also including a buffer memory having a data I/O port and a control port, where the system memory has an array of storage elements defined as sequentially addressed system word storage elements and with a selected subarray of storage elements embedded in the array defined by a starting address, an increment between rows (IBR) of the elements of the selected subarray and an increment between columns (IBC) of the elements of the selected subarray and a number of columns (NC), an improved system for transferring data from said selected subarray to said buffer during an SMEM read operation and from said buffer to said selected subarray during an SMEM write operation comprising:

a system BUS (SBUS) including W word-segments, said system BUS coupled to the SMEM data I/O port so that the system words stored in the storage elements of a WW of said SMEM are transferred to corresponding word-segments of said SBUS during an SMEM read and so that the system words on said word-segments are transferred to corresponding storage elements in the WW during a SMEM write operation;

a packing MUX for controllably coupling a selected word-segment of said SBUS to the I/O port of said buffer memory;

a scattering DEMUX for controllably coupling the I/O port of said buffer memory to a selected word-segment of said SBUS;

read control means, coupled to said SMEM, said packing MUX, and said buffer memory, for controlling said SMEM to transfer a subarray WW, being a WW including subarray system words stored in storage elements of said selected subarray, to said SBUS, with said subarray WW being on the SBUS for one WW cycle, for controlling said packing MUX to sequentially couple only the word-segments of the SBUS having subarray system words thereon to the data I/O port of the buffer memory during said WW cycle, and for sequentially writing the subarray system words transferred by said packing MUX to the I/O port of said buffer memory into selected storage locations in said buffer during said WW cycle; and

write control means coupled to said SMEM, said scattering DEMUX, and said buffer memory for sequentially reading system words to be stored in the subarray storage elements from selected storage elements in said buffer memory, for controlling said scattering DEMUX to sequentially couple the I/O port of said buffer memory to only the subarray word-segments of SBUS corresponding to the subarray storage locatins of a given WW in said SMEM, and for sequentially writing each system word, transferred from said buffer memory to said subarray word-segments, into subarray storage locations of said given WW in said SMEM.

4,841,436

TAG DATA PROCESSING APPARATUS FOR A DATA FLOW COMPUTER

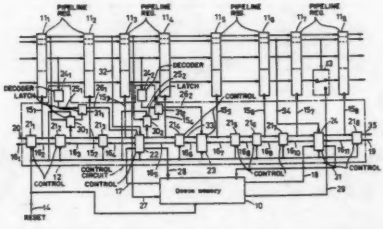
Hajime Asano, Toyonaka; Hiroaki Terada, Suita; Katsuhiko Asada, Amagasaki; Hiroaki Nishikawa, Suita; Masahisa Shimizu, Kadoma; Hiroki Miura, Hirakata; Kenji Shima, Nishinomiya; Shinji Komori, Itami; Souichi Miyata, Shiki, and Satoshi Matsumoto, Uda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma; Sanyo Electric Co., Ltd., Moriguchi; Mitsubishi Denki Kabushiki Kaisha, Tokyo and Sharp Corporation, Osaka, all of, Japan

Filed May 30, 1986, Ser. No. 868,701

Claims priority, application Japan, May 31, 1985, 60-119034

Int. Cl.[4] G06F *9/18*

U.S. Cl. 364—200 **2 Claims**



1. A tag data processing apparatus for a data flow computer wherein tag data, representing an identifier of the context of program execution, and operation instructions are carried on tokens moving in first in-first out queues, said tag data processing apparatus comprising:

a plurality of serially connected pipeline registers for holding and transmitting tokens having tag data associated therewith, each pipeline register having an input end, an output end, and an enable lead, wherein said output end of a preceding pipeline register is connected to said input end of a succeeding pipeline register;

queue memory means for storing usable tag data to be added to tokens having a tag add instruction and for storing tag data from tokens having a restore instruction, said queue memory means having a data input end operatively connected with said output ends of said pipeline registers, a data output end operatively connected with said input ends of said pipeline registers and having an enable lead; and

control means, operatively connected to said pipeline registers, including:

means for detecting that a token in one of said pipeline registers is a tagged token, and has one of a tag restoring instruction or a tag adding instruction;

means for producing signals on said enable lead of said queue memory means for (a) writing the tag of a tagged token that is detected to have a tag restoring instruction to said queue memory means, and (b) writing a tag from said queue memory means to a tagged token which has a tag adding instruction,

means for erasing said added tag from said queue memory means; and

means for generating clock pulses for moving tokens through said pipeline registers;

said control means causing said queue memory means to store said tags from said tagged token having a tag restoring instruction only when said token is detected to be tagged with said tag restoring instruction and said queue memory means is ready for input;

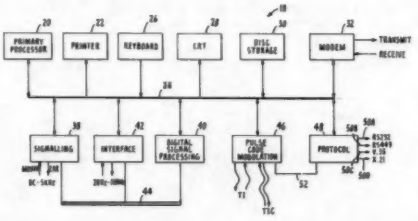
said control means causing said tag to be erased from said queue memory means only when a particular condition is satisfied, and said control means causing said tag from the output of said queue memory means to be written to said token only when said token is determined to have a tag adding instruction and said queue memory means is ready to produce output.

4,841,437

SYSTEM ARCHITECTURE FOR A TEST APPARATUS HAVING PRIMARY AND DEPENDENT PROCESSORS

Andre Labarsky, Sunnyvale, and Richard E. Pospisil, Cupertino, both of Calif., assignors to LP COM, Mountain View, Calif.

Filed Sep. 18, 1985, Ser. No. 777,173
Int. Cl.[4] G06F *13/40*
U.S. Cl. 364—200 **3 Claims**



1. An apparatus for analyzing communication lines, comprising:

a primary processor;

a digital information bus;

a dependent processor for digitally processing analog singals, said dependent processor being connected to said primary processor via said digital information bus;

an analog information bus; and

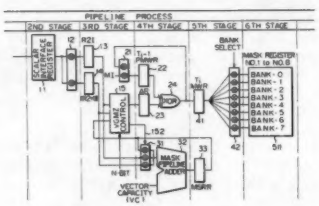
an interface module connected to said primary processor via said digital information bus and to said dependent processor via said analog information bus, said interface module having a means to connect said interface module to the communications lines to be analyzed so that the interface module may send analog signals to the communications lines and the interface module may receive analog signals from the communications lines, wherein the primary processor controls the signals passing between the interface module and the communications lines by sending digital instructions to both said dependent processor and said interface module via said digital information bus, and wherein said dependent processor and said interface module communicate using analog signals via said analog information bus.

4,841,438

SYSTEM FOR GENERATING MASK PATTERN FOR VECTOR DATA PROCESSOR

Akira Yoshida, and Yuuichi Sasaki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Sep. 19, 1986, Ser. No. 909,335
Claims priority, application Japan, Sep. 19, 1985, 60-207502
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **6 Claims**



1. A system for generating a mask pattern for a vector data processor having a mask register and a vector register in which, the value of the mask register is "1", a calculation is executed for the corresponding element of the vector register, and when the value of the mask register is "0", a calculation is not executed, in accordance with a calculational mask function, said system comprising:

designation means for designating sequential "i" elements of "0" or "1" from a beginning element of the mask register and subsequent sequential "j" elements of "1" or "0"; and

control means for rendering the "i" elements to be "0" or "1", the "j" elements to be "1" or "0", and the remaining elements to be all "0's" or all "1's", when "i" plus "j" is smaller than a vector length which is the object of the calculation of a vector data operand used in a vector instruction, a desired pattern of "0" or "1" being generted in the mask register.

4,841,439

METHOD FOR RESTARTING EXECUTION INTERRUPTED DUE TO PAGE FAULT IN A DATA PROCESSING SYSTEM

Atsuhiko Nishikawa, Mito; Yoshihiro Miyazaki, Hitachi; Masayuki Tanji, Hitachi; Soichi Takaya, Hitachi, and Shinichiro Yamaguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 917,974
Claims priority, application Japan, Oct. 11, 1985, 60-224765
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **4 Claims**

1. A method for restarting execution of an instruction interrupted due to a page fault in a data processing system having a main memory, means for storing microprograms of microinstructions, a microprogram counter for holding a microprogram address, a program counter for holding a program ad-

dress, and an external memory, said method comprising the steps of:

storing microinstructions, including a microinstruction for main memory access and a microinstruction for waiting for a reply to a main memory access for a fixed number N of operating steps after execution of said microinstruction for a main memory access;

executing said microinstruction for main memory access without saving a current microprogram address;

executing said microinstruction for waiting for a reply to a main memory access without incrementing said microprogram counter until a reply to the memory access is received;

branching from said microinstruction for waiting for a reply to a main memory access to an exception processing microprogram when a reply to a main memory access is received and a page fault is indicated;

executing said exception processing microprogram by saving a microprogram address which is obtained by substracting N from the address of said microinstruction for waiting for a reply to a main memory access and for setting a new program address in said program counter for executing a procedure for recovery of a page fault; and

executing said procedure for recovery of a page fault by loading a page for which said page fault has occurred into said main memory from said external memory and resetting the program counter and restoring the microprogram address which is saved by said exception processing microprogram;

thereby effecting the restart of the instruction execution.

4,841,440

CONTROL PROCESSOR FOR CONTROLLING A PERIPHERAL UNIT

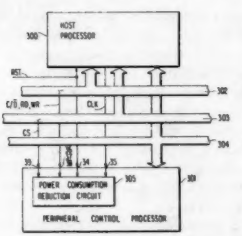
Kazuya Yonezu, and Keiji Matsumoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,274

Claims priority, application Japan, Apr. 26, 1983, 58-73280

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—200 **9 Claims**



1. A peripheral control processor for use with a host processor and a peripheral unit, said peripheral control processor receiving an external clock signal and an external reset signal, said peripheral control processor comprising:

a first terminal for receiving said external clock signal;

a second terminal for receiving said external reset signal to initialize said peripheral control processor;

a third terminal for receiving a chip select signal;

a fourth terminal for receiving a reading signal or a writing signal;

a data communication circuit, coupled to said first to fourth terminals, for transferring data between said host processor and said peripheral unit on the basis of timing control by said external clock signal, said data communication circuit being enabled by said chip select signal and initialized by said external reset signal, said data communication circuit transferring said data from said host processor to said peripheral unit in response to said writing signal and from said peripheral unit to said host processor in response to said reading signal; and

a control circuit coupled between said first terminal and said data communication unit and connected to said second, third and fourth terminals, said control circuit permitting said external clock signal to be supplied to said data communication circuit when both of said chip select signal and said reading signal or said writing signal are received, and inhibiting application of said external clock signal to said data communication circuit when said external reset signal is received, wherein said data communication circuit it initialized and power consumption of said data communication circuit is reduced in response to said external reset signal.

4,841,441

METHOD OF CREATING A COMPUTER SYSTEM

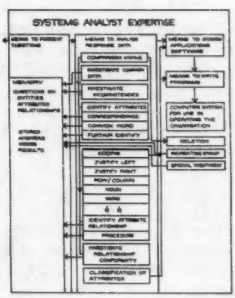
Rodger J. Nixon; Peter J. C. Roselli; David I. Armstrong; Martin K. Lindley, and Imogen E. de la Bere, all of Christchurch, New Zealand, assignors to Adata Software Limited, Christchurch, New Zealand

Filed Aug. 1, 1985, Ser. No. 761,748

Claims priority, application New Zealand, Aug. 1, 1984, 209070; Mar. 29, 1985, 211641

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—401 **26 Claims**



1. A method of constructing a data model of an organizational structure and the operation thereof which comprises the stages of analysing data provided by the customer organization (analysis), designing application software (procedure design), writing programs which collectively enable control of the operating procedures of the organization (programming) and testing the individual programs characterized by performing the stage of analysis with a data processing machine, wherein the analysis stage comprises:

storing in memory of the machine a source series of questions which are presentable in conversational language concerning the entities in the organizational structure, the

attributes of those entities, and the relationship between the entities; and

constructing a data model from the answers.

4,841,442

POS SYSTEM FOR UPDATING LOOK-UP TABLE

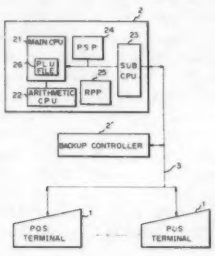
Osamu Hosoyama, Takasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 27, 1985, Ser. No. 813,951

Claims priority, application Japan, Dec. 27, 1984, 59-280629

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—405 **15 Claims**



1. A point of sales (POS) system comprising:

a central computer; and

a plurality of POS terminals connected to said central computer, said central computer including:

a main look-up table for storing article data;

first means for sending and receiving a text;

means for analyzing the text received by said first means;

means for searching the contents of said main look-up table based on the analysis by said analyzing means;

means for compiling a response text based on the findings of the search by said searching means; and

means for updating the article data stored in said main look-up table based on the analysis by said analyzing means, each of said POS terminals including:

second means for sending and receiving a text;

means for compiling an inquiry demand text which demands an inquiry into the article data in said main look-up table;

means for compiling an update demand text which demands an update of the content of said main look-up table; and

means for inputting replacement data to s aid main look-up table;

wherein said central computer, in response to receipt of an inquiry demand text sent from one of said POS terminals, causes said analyzing means to analyze the received text, causes said searching means to search the contents of said main look-up table according to the result of the analysis, causes said response text compiling means to compile a response text according to the findings of the search, and causes said first means for sending and receiving a text to send the response text to said one of said POS terminals, and

wherein said central computer, in response to the update demand text sent from said one of said POS terminals, causes said analyzing means to analyze the received text, and updates the data stored in said main look-up table with updated data input and sent from said one of said POS terminals by changing the data stored in said main look-up table to new data.

4,841,443

METHOD OF AND APPARATUS FOR AUTOMATICALLY READING 5 BAND ARRAYAL PATTERN

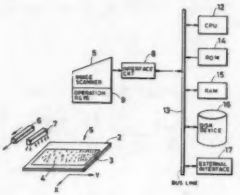
Shigeru Kakumoto, Kodaira; Tatsuo Sumi, and Tetsuo Kurisu, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Software Engineering Co., Ltd., both of Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 924,788

Claims priority, application Japan, Oct. 30, 1985, 60-241548; Oct. 30, 1985, 60-241549

Int. Cl.[4] G06K *9/00, 9/12*

U.S. Cl. 364—413.01 **15 Claims**



1. A method of automatically reading a band arrayal pattern having a plurality of bands in patterns arrayed substantially in a first direction and within a plurality of lanes extending substantially in a second direction perpendicular to the first direction, said method comprising the steps of:

photoelectrically scanning the pattern to generate density data items made up of pixels;

detecting histograms from the generated density data items, said histograms consisting of sums of the density data items of the pixels in a plurality of straight lines in said second direction;

detecting from said histograms representative points for respective lanes, the points representing positions of said respective lanes in said first direction;

detecting for said respective lanes density data trains of the pixels in straight lines in said second direction and passing the detected representative points; and

detecting positions of the plurality of bands within said respective lanes in said second direction from the detected density data trains.

4,841,444

METHOD FOR CONTINUOUS ESTIMATION BY NON-LINEAR SIGNAL MATCHING OF SEISMIC TRACES

Chittibabu Chittineni, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 831,382, Feb. 20, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 253,353

Int. Cl.[4] G01V *1/36;* G06K *9/48*

U.S. Cl. 364—421 **15 Claims**

1. A method for determining a continuous velocity for the propagation of acoustic seismic pulses through subsurface formations in a system where acoustic pluses are generated by a seismic source transmitted into the earth, reflected back by interfaces, detected by seismic pulse receivers and converted to electrical signals representing a series of sequentially detected acoustic pulses, said method including the steps of:

receiving signals representing detected acoustic pulses;

selecting signals representing acoustic pulses having a common reflection midpoint between a seismic source and a seismic pulse receiver;

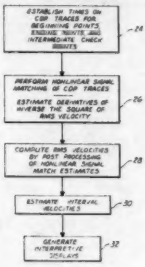
determining a beginning point, intermediate points and an end point for each selected signal;

estimating non-linear signal match curves for said selected signals;

calculating derivatives of the inverse of the square of the

root mean square velocity of the acoustic pulses represented by each said selected signal;

computing root mean square velocities of the acoustic pulses by integrating said derivatives;



estimating interval velocities for the acoustic pulses between interfaces;

establishing a continuous velocity for the acoustic pulses; and

displaying said estimated interval velocities.

4,841,445

ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

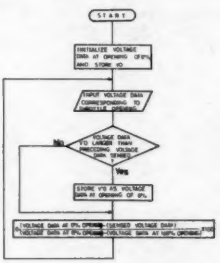
Masanari Yamamoto; Yasunobu Ito, and Shouji Yokoyama, all of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Aug. 10, 1987, Ser. No. 83,392

Claims priority, application Japan, Aug. 11, 1986, 61-188197

Int. Cl.[4] G06F *15/50, 7/70*

U.S. Cl. 364—424.1 **1 Claim**



1. An electronically controlled automatic transmission having shift solenoids controlled by a microcomputer in dependence upon a vehicle velocity signal and a throttle opening signal, which comprises:

a throttle opening sensor for generating a voltage conforming to a throttle opening;

memory means for storing voltage data V_0 of a throttle opening of 0% and voltage data V_{100} of a throttle opening of 100%;

means for comparing at least one of a sensed voltage data V'_0 of a throttle opening of 0% and a sensed voltage data V'_{100} of a throttle opening of 100% respectively to V_0 and V_{100} in said memory means and for rewriting at least one of V_0 in said memory means with V'_0 when V_0 and V'_0 are different and V_{100} in the memory means with V'_{100} when V_{100} and V'_{100} are different; and

arithmetic means for calculating a throttle opening θ_α corresponding to a sensed voltage data V_α based on a ratio of a difference between said voltage data V'_0 corresponding to a throttle opening of 0% in said memory means and said sensed voltage data V_α to a difference between said voltage data V'_0 corresponding to a throttle opening of 0% and said voltage data V'_{100} corresponding to a throttle opening of 100% in said memory means.

4,841,446

METHOD FOR MONITORING THE OPERATIONS OF AN ELECTROMECHANICAL CONTROL SYSTEM THAT ENSURES THE ADHESION OF WHEELS OF A MOTOR VEHICLE

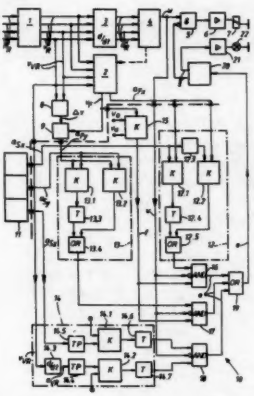
Heinz Leiber, Oberriexingen, and Hans-Joachim Ohnemüller, Reutlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,504

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644139

Int. Cl.[4] B60T *8/00*

U.S. Cl. 364—426.02 **19 Claims**



1. A safety switching arrangement for monitoring and controlling the operations of an electromechanical control system that ensures the adhesion of heels of a motor vehicle, such as an antilock system or an antislip control system by a control system control signal, that is equipped with wheel rotation speed signal generators and a reference circuit for the determination of the wheel speeds, vehicle speed and vehicle acceleration from wheel rotation speeds, said safety switching arrangement comprising:

first input means for receiving first set of vehicle acceleration signals derived from wheel speeds and vehicle speed, in said reference circuit;

second input means for receiving second set of vehicle acceleration signals from acceleration sensors fixed at the vehicle;

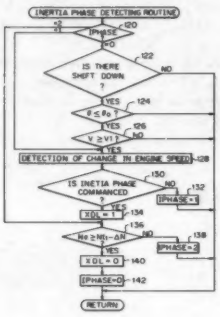
evaluation means for comparing said first and second set of acceleration signals to determine whether they match within a band width and generating an error signal to disable said control system and activate a warning indicator when the acceleration signals do not match within said band width; and

third input means for receiving a control system control signal as a blocking signal and suppressing said evaluation means from generating an error signal in response to said blocking signal.

4,841,447
SYSTEM FOR CONTROLLING IDLING SPEED IN INTERNAL COMBUSTION ENGINE FOR VEHICLE WITH AUTOMATIC TRANSMISSION

Kazuhiko Hayashi, Nagoya; Shigeru Kuroyanagi, Okazaki, and Kunihiro Iwatsuki, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 22, 1986, Ser. No. 866,333
Claims priority, application Japan, May 22, 1985, 60-109746
Int. Cl.[4] F02M *51/00*
U.S. Cl. 364—431.07 **5 Claims**



1. In a system for controlling engine idling speed for an internal combustion engine of a vehicle provided with an automatic transmission, the engine being provided with an intake line and a throttle valve arranged therein, said system comprising:

a by-pass passageway connected to the intake line so as to by-pass the throttle valve;

valve means arranged in the by-pass passageway for controlling the amount of air passing therethrough;

means for calculating the degree of opening of the valve means corresponding to a preset parameter corresponding to an intake air amount during a substantially fully closed condition of the throttle valve; and

means for producing a signal directed to the valve means for operating the same so that the actual opening of the valve means corresponds to the opening calculated by the calculating means, the improvement wherein the system further comprises apparatus for decreasing shock when the automatic transmission is downshifted, the apparatus comprising

means for detecting a shift down operation of the automatic transmission while the vehicle is in an engine braking condition wherein the net torque output of the engine is negative; and

means for modifying the calculated degree of opening of the throttle bypass valve means so that the amount of air is increased during the shift down operation, thereby reducing the engine pumping inertia.

4,841,448
WINDSHEAR FLIGHT RECOVERY COMMAND SYSTEM

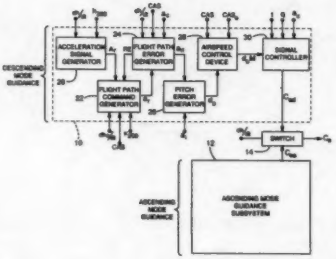
Douglas W. Ford, Hillsboro, Oreg., assignor to Flight Dynamics, Inc., Portland, Oreg.

Filed Sep. 1, 1987, Ser. No. 92,089
Int. Cl.[4] G06F *15/50*; **G05D** *1/08*
U.S. Cl. 364—433 **17 Claims**

17. A system for generating a guidance signal for directing a descending aircraft to recover from a windshear condition, the parameters characterizing the descent of said aircraft including airspeed, vertical velocity, and a first flight path, comprising:

means receiving signals corresponding to said vertical velocity, airspeed, and first flight path for generating a pitch error signal representing the difference between said first flight path signal and a flight path command signal, the flight path command signal being generated from said vertical velocity and airspeed signals and representing a second flight path by which said aircraft can arrest its descent by a predetermined altitude;

means for preventing said pitch error signal from assuming values that exceed a predetermined angle corresponding to a maximum safe angle of attack of said aircraft;



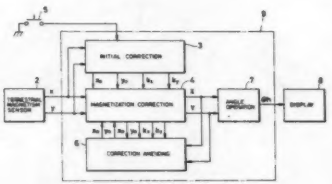
means for adjusting said pitch error signal in accordance with said airspeed signal, thereby to compensate said pitch error signal for any airspeed in excess of said aircraft's normal flight requirements; and

means for limiting said flight path command signal to values corresponding to descent angles greater than a predetermined level below horizontal.

4,841,449
DIRECTION FINDER

Mitiyo Suyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,787
Claims priority, application Japan, Oct. 8, 1986, 61-240687
Int. Cl.[4] G01C *17/38*
U.S. Cl. 364—449 **1 Claim**



1. A direction finder for use on a movable body, comprising:

terrestrial magnetism sensor means mounted on a movable body and operable to detect a terrestrial magnetism as a pair of magnetic field components which are parallel to a terrestrial surface and provide an orthogonal pair of detection signals corresponding thereto, respectively;

initial correction means for obtaining, on a basis of maximum and minimum values of said pair of detection signals from said terrestrial magnetism sensor means obtained as said movable body is directed along a circular route, radii of a circular locus of said movable body on a perpendicular coordinate system including coordinates of said pair of detection signals and a pair of error correction amounts for use in cancelling components of detection signals which are due to a magnetization field of said movable body;

magnetization correction means for correcting a further detected pair of detection signals from said terrestrial

magnetism sensor menas, on a basis of said error correction amounts and providing a pair of corrected detection signals; and

correction amount amending means for obtaining, from said pairs of detection signals, two circles having a common radius identical in length to that of a circle corresponding to said circular locus obtained by said initial correction means, said two circles passing through respective coordinate points corresponding to said pair of corrected detection signals from said magnetizing correction means before and after said movable body changes a moving direction, and for amending said error correction amounts on a basis of center coordinates and radii of said circles according to said pair of corrected detection signals obtained before and after said change of a moving direction of said movable body when a coordinate point corresponding to said corrected detection signal pair from said magnetizing correction means during a change of a moving direction of said movable body is within a predetermined distance from either of said two circles.

4,841,450

ARRANGEMENT COMPRISING A SYSTEM PROVIDING MOVEMENT, PROCESSING AND/OR PRODUCTION

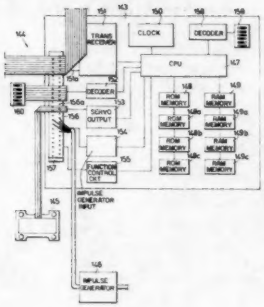
Lars-Berno Fredriksson, Kinna, Sweden, assignor to Kvaser Consultant, AB, Kinna, Sweden

Continuation of Ser. No. 731,626, May 1, 1985, abandoned. This application Apr. 19, 1988, Ser. No. 183,126

Claims priority, application Sweden, Sep. 2, 1983, 8304743

Int. Cl.[4] G05B *19/18*

U.S. Cl. 364—468 **11 Claims**



1. A distributed control system for performing functions at a plurality of physically separated function points, conprising:

(a) at each function point:

(i) actuating means for carrying out a specific function; and

(ii) function control means for controlling said actuating means, said function control means including a programmable microprocessor having an associated memory and interface, said microprocessor being configurable to provide a selected control function for controlling one of a plurality of different types of actuating means;

(b) at least one of said function points comprising:

(i) a sensor connected to said actuating means and to an input of said function control means, and forming a continuous feedback loop;

(c) a common computer connected to the function control means of each function point through a first common connection loop, said computer comprising:

(i) means for transmitting, during a start up phase, a first set of digital signals for configuring the function control means of each function point to provide a selected control function; and

(ii) means for transmitting to the function control means of each function point, during an operating phase, a second set of digital signals comprising operating commands for the specific function to be carried out by the actuating means controlled by said function control means; and

(d) means for supplying energy to said actuating means through a second common connection loop.

4,841,451

SYSTEM FOR MEASURING THE DURATION RATIO OF PULSES OF VARIABLE FREQUENCY

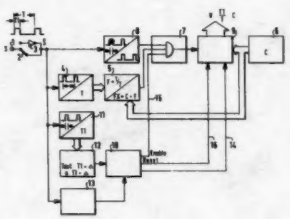
Bernd Rumpf, Friedrichsdorf, and Wolfgang Reisch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 7, 1987, Ser. No. 35,556

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611565

Int. Cl.[4] G01R *29/02;* **H03K** *5/26*

U.S. Cl. 364—484 **15 Claims**



1. A system for measuring the duration ratio of input pulses in a pulse train of variable pulse repetition frequency, particularly in electronically controlled fuel-injection systems for internal combustion engines, comprising

means for generating clock pulses at a variable frequency which is a predetermined multiple of the pulse repetition frequency of the input pulses; and

means responsive to the clock pulses for determining the duration ratio, said ratio determining means including means for counting the clock pulse during each input pulse.

4,841,452

Patent Not Issued For This Number

4,841,453

MULTIDIRECTIONAL SCAN AND PRINT CAPABILITY

David E. Finlay; Stephen D. Hanna, both of Boulder; David C. Stevenson, Longmont, and John T. Varga, Boulder, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 10, 1986, Ser. No. 929,036

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—519 **15 Claims**

1. An apparatus for generating symbols to be image on an output device in successive rows of symbols, scanned in a raster fashion along successive scan lines in which said scan lines can be parallel to said rows of symbols and directed left to right, successive scan lines progressing from top to bottom or vice versa, or said scan lines can be perpendicular to said rows of symbols and directed top to bottom, successive scan lines progressing left to right or vice versa, said apparatus including:

a page buffer containing a representation of said symbols in a predetermined order, each such representation including an address escape pointer,

a column position escape memory specifying for each of said rows of symbols a page buffer pointer to a first symbol in said row and a height factor identifying a space allotted for presentation of said symbol row,

an address escape memory with a record for each different

symbol containing a font pointer and a representation of space allotted for said symbol in orthogonal directions,

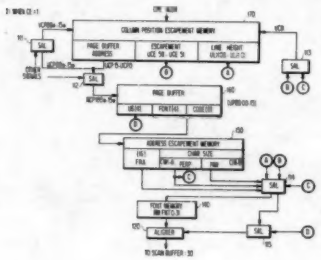
a font memory with a record for each symbol providing a graphic representation of said symbol in at least two orientations,

means for storing a print command specifying a specific relation between scan direction, scan progression and rows of symbols,

first means responsive to said print command for accessing said column position escape memory to identify said first symbol for a selected row of symbols by said page buffer pointer,

second means responsive to said first means for accessing a corresponding entry in said page buffer including said address escape pointer,

third means responsive to said second means for accessing said address escape memory to derive font addressing information,



addressing means responsive to said print command and to said second and third means and to said font memory for deriving output information,

said addressing means including means for successively deriving different font addresses for a given symbol until a quantity of data extracted from said font memory bears a specified relation to data extracted from said address escape memory,

said addressing means further including means for developing fill bits for insertion into said output information, said fill bits related to a difference between said data extracted from said address escape memory related to a dimension of said symbol and said line height data from said column escape memory whereby spacing of rows of symbols may be freely selected to be larger than a dimension of any symbol on said row.

4,841,454

DISPLAY CONTROLLER WITH A VARIABLE SCROLLING SPEED, AND METHOD FOR OPERATING SAME

Koichi Awazu, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1987, Ser. No. 43,022

Claims priority, application Japan, Apr. 30, 1986, 61-100753

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—521 **7 Claims**

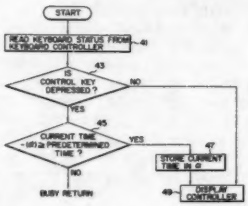
1. A data display-controlling device for use with a data processing apparatus, which includes a keyboard for entering data and a display unit for displaying the data, and which controls said keyboard unit and said display unit by executing an operating system program, said data display-controlling device comprising:

scroll display controller means for displaying display data on said display unit in a scrolling manner;

designating means, coupled to said display controller means, for designating said scroll display controller means to scroll-display the display data on said display unit at one of a high speed and a low speed;

timer means for measuring a current time; and

control means for outputting display data to said display unit, in response to said designating means designating the scroll-display at low speed, by: (1) determining, based on



the current time from said timer means, whether a predetermined time has elapsed since a last output of display data, (2) executing the operating system program until the predetermined time elapses, and (3) outputting display data to said display unit when said predetermined time has elapsed.

4,841,455

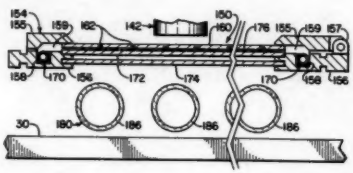
RESEAU APPARATUS FOR PHOTOGRAMMETRY DEVICES

Franz W. Leberl; Sean Curry; Denis Henrot, all of Boulder; Milan Karspeck, Loveland, and Scott Lee, Boulder, all of Colo., assignors to Vexcel Corporation, Boulder, Colo.

Filed Aug. 3, 1987, Ser. No. 81,147

Int. Cl.[4] G02B *15/626*

U.S. Cl. 364—525 **16 Claims**



1. Reseau grid apparatus for providing grid marks for an image on an object to be photographed or digitized by a camera, comprising:

an object mounting plate for supporting the object;

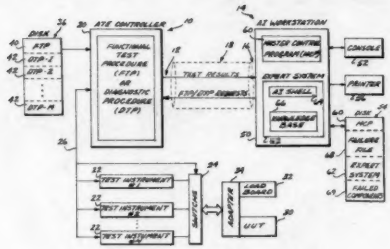
reseau means for holding the object on the mounting plate and for providing reseau grid marks correlated geometrically with the image, said reseau means including a thin transparent reseau plate adapted for positioning on the object mounting plate and having two opposite planar surfaces with edges around its perimeter, a plurality of grid marks in the form of grooves etched on one of the surfaces of the reseau plate, and grid illumination means positioned adjacent an edge of the reseau plate for illuminating the grid marks by directing light longitudinally through said reseau plate from the edge of the reseau plate to the grooves in the surface of the reseau plate;

an object illumination means adjacent said object mounting plate for illuminating the image on an object positioned on the object mounting plate.

4,841,456
TEST SYSTEM AND METHOD USING ARTIFICIAL INTELLIGENCE CONTROL

Thomas J. Hogan, Jr., Enumclaw; Jon J. Kasprick, Federal Way; Donald R. Anderson, Auburn, and Douglas W. Kersh, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 9, 1986, Ser. No. 906,104
Int. Cl.[4] G01R *31/28*
U.S. Cl. 364—550 5 Claims



1. An apparatus for testing an electronic unit under test (UUT), comprising:

(a) an automatic test system comprising an automatic test equipment (ATE) controller, at least one test instrument connectable to the ATE controller and to the UUT, and storage means for storing a functional test procedure (FTP) for the UUT, the ATE controller including an ATE port, and ATE data processing means for executing the FTP in response to a start FTP command and for providing an FTP data set at the ATE port, the FTP data set comprising data indicating the results obtained by executing the FTP;

(b) communication means connected to the ATE port; and

(c) an artificial intelligence (AI) system comprising an AI data processor having an AI port through which the AI data processor is connected to the communication means, means for receiving the FTP data set via the AI port, and expert system means for processing the FTP data set when the FTP data set indicates that a failure has occurred to identify, if possible, the defective UUT portion that may have caused the failure, and for producing output data that identifies the defective UUT portion.

5. A method of testing an electronic unit under test (UUT) comprising the steps of:

(a) connecting the UUT to a testing apparatus comprising an automatic test system connected via communication means to an artificial intelligence (AI) system, the automatic system comprising an automatic test equipment (ATE) controller, at least one test instrument connectable to the ATE controller and to the UUT, and storage means for storing a functional test procedure (FTP) for the UUT, the AI system comprising an AI data processor and expert system means;

(b) causing the ATE controller to execute the FTP, such that the ATE controller produces an FTP data set;

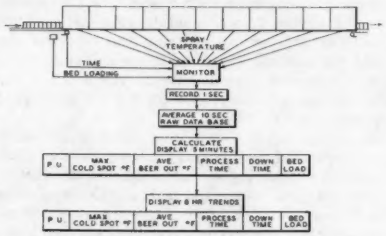
(c) transmitting the FTP dat set to the AI system via the communication means; and

(d) causing the expert system to process the FTP data set when the FTP data set indicates that a failure has occurred to identify, if possible, the defective UUT portion that may have caused the failure.

4,841,457
PASTEURIZATION MONITORING PROCESS

Carl W. Clyne, St. Louis County; Gary L. Woolever, Madison County; James Teng, St. Louis County, and Hooshang Naji, St. Louis, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Jul. 8, 1987, Ser. No. 71,142
Int. Cl.[4] A61L *2/04*; G01K *1/16*
U.S. Cl. 364—557 8 Claims



1. A system for continuously and automatically monitoring a tunnel pasteurizer including

a tunnel pasteurizer having a finite length divided into a succession of zones and having a finite width and means for passing packages through the tunnel from one end to the other thereof,

water spray means for spraying water onto packages passing through the tunnel at a uniform spray density across the width of the tunnel and at progressively different temperatures to form a heating zone, a holding zone and a cooling zone from the one end to the other of the tunnel,

means for continuously measuring spray water temperatures in the zones along the length of the pasteurizer,

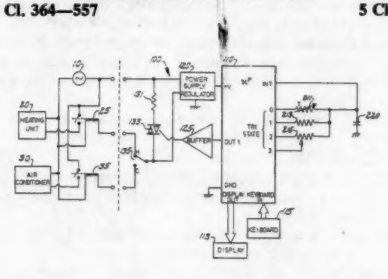
means for continuously measuring the time each package remains in each zone; and

means responsive to the measured spray water temperatures and measured times each package remains in each zone for empirically determining the P.U. input to each package leaving the pasteurizer tunnel.

4,841,458
ANALOG TO DIGITAL CONVERSION BY MEASURING THE RATIO OF RC TIME CONSTANTS

Michael R. Levine; Victor Rigotti; James Russo, all of Ann Arbor, and Nicholas Skogler, Ypsilanti, all of Mich., assignors to Honeywell, Incorporated, Minneapolis, Minn.

Filed Jul. 7, 1987, Ser. No. 70,727
Int. Cl.[4] G01K *7/24*; G01R *27/02*
U.S. Cl. 364—557 5 Claims



1. An analog to digital conversion apparatus comprising:

an analog sensing device having a variable resistance dependent upon an environmental condition, having a first terminal and a second terminal;

a precision fixed resistor having a resistance value near the

nominal value of resistance of said analog sensing device, having a first terminal and a second terminal;

a capacitor having a first terminal connected to said second terminal of said analog sensing device and said second terminal of said precision fixed resistor and a second terminal connected to a reference voltage;

a discharge means connected to said capacitor for discharging said capacitor;

a first time constant measuring means connected to said analog sensing means, said capacitor and said discharge means for measuring the variable time constant of said analog sensing device by discharging said capacitor via said discharge means, charging said capacitor through said first terminal of said analog sensing device and counting the number of predetermined time intervals required for the voltage across said capacitor to reach a predetermined threshold voltage;

a second time constant measuring means connected to said precision fixed resistor, said capacitor and said discharge means for measuring the reference time constant of said precision fixed resistor and said capacitor by discharging said capacitor via said discharge means, charging said capacitor through said first terminal of said precision fixed resistor and counting the number of predetermined time intervals required for the voltage across said capacitor to reach said predetermined threshold voltage;

a measurement sequence means connected to said first time constant measurement means and said second time constant measurement means for producing a sequence of measurements by causing said second time constant measurement means to measure said reference time constant a first time thereby producing a first count, then causing said first time constant measurement means to measure said variable time constant, then causing said second time constant measurement means to measure said reference time constant a second time thereby producing a second count, and for comparing said first count and said second count and repeating said sequence of measurements if said first count and said second count differ by more than a predetermined amount; and

a ratio means connected to said first time constant measurement means, said second time constant measurement means and said measurement sequence means for computing the digital ratio of the count of predetermined time intervals of said variable time constant and the count of predetermined tim intervals of said reference time constant if said first count and said second count do not differ by more than a predetermined amount, said ratio being the digital representation of the environmental condition sensed by said analog sensing device.

4,841,459

TEMPERATURE INDICATING CONTROL APPARATUS HAVING DATA STORING FUNCTION

Go Ikeda, Susono; Kiyoshi Sasaki, Mishima; Hiroshi Kumazaki; Shigeru Fujita, both of Numazu, and Hideo Banzai, Mishima, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,424
Int. Cl.[4] G06F *19/46*; F27D *3/00*
U.S. Cl. 364—557 **5 Claims**

1. A temperature indicating control apparatus for indicating and controlling the temperatures of a plurality of positions of a device, comprising:

a setting device for setting set data required for controlling the temperatures of the plurality of positions;

a plurality of indicators for selectively indicating plural groups of the set data or detected values of the temperatures of the plurality of positions,

each of said plurality of indicators being of a plural digit type, and being accompanied by an increment switch and a decrement switch both operable as the setting device,

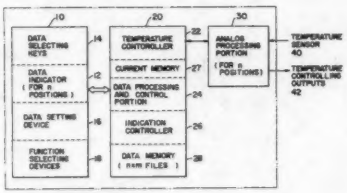
a calculating device for calculating control values for controlling temperatures of the plurality of positions based on the set data and the detected values;

an input and output device for receiving said detected values from outside sensors and delivering said control values to outside control elements;

a function selecting device for selecting a LOCAL operation and a REMOTE operation; and a data memory for storing said plural groups of set data required for controlling the temperatures of the plurality of positions;

a current memory for storing set data which is currently used for controlling temperatures of the plurality of positions; and

means for controlling the indication of said plurality of indicators and the transfer of the set data between said



data memory and said current memory in accordance with the operating results of said function selecting means,

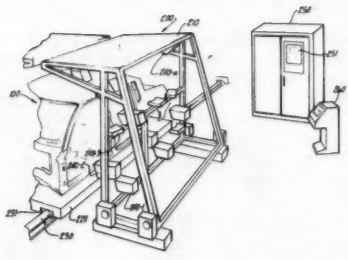
wherein said function selecting means comprises LOCAL, REMOTE, MONITOR, SET, STORE and LOAD operation selecting keys, said function selecting means comprises keys which designate a code number of functions of LOCAL, REMOTE, MONITOR, SET, STORE and LOAD, and said function selecting means are constructed such that when the REMOTE key is operated, the MONITOR, SET, STORE and LOAD keys are made inoperative and said current memory is controlled by an outside computer and the like, while when the LOCAL key is operated, any one of the aforementioned keys is made operable.

4,841,460

METHOD AND APPARATUS FOR CALIBRATING A NON-CONTACT GAUGING SENSOR WITH RESPECT TO AN EXTERNAL COORDINATE SYSTEM

Robert Dewar, Troy, and Dale R. Greer, Novi, both of Mich., assignors to Perceptron, Inc., Farmington Hills, Mich.

Filed Sep. 8, 1987, Ser. No. 94,329
Int. Cl.[4] G06G *7/48*; H04N *7/18*
U.S. Cl. 364—571.02 **38 Claims**



1. A method for calibrating an arbitrarily oriented non-contact measurement sensor that is pre-calibrated and includes a structural light source and optical sensing means, with respect to an external coordinate system, the method comprising:

using the structured light from the sensor to create a target lying simultaneously within a measuring zone of the sensor and a measuring zone of measuring means external to the sensor;

using the sensor to determine first spatial coordinates of the target expressed in terms of the sensor's coordinate system;

using the external measuring means to determine second spatial coordinates of the target expressed in terms of the external coordinate system; and

transforming the first spatial coordinates into the coordinates expressed in terms of the external system using the first and second spatial coordinates of the target.

4,841,461

FILTER ADJUSTMENT APPARATUS AND METHOD

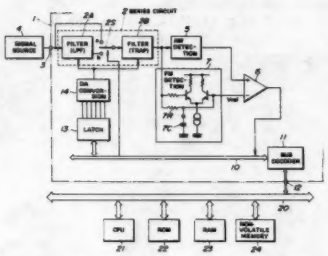
Yoshihiro Yamamoto, Tokyo; Tsutomu Kume, Ibaraki; Nobuo Yamazaki; Fumiharu Hashimoto, both of Tokyo, and Koichi Ohya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,719

Claims priority, application Japan, Dec. 27, 1986, 61-315055; Dec. 27, 1986, 61-315053

Int. Cl.[4] G06F *7/38;* H03F *1/34*

U.S. Cl. 364—572 **17 Claims**



1. A filter adjustment apparatus for adjusting frequency characteristics of a filter comprising:

a filter having characteristics which are adjusted by adjustment data;

means for supplying said adjustment data to said filter;

a signal processing circuit connected in series with said filter; and

means for setting said signal processing circuit to a state of not influencing said filter, said setting means including switch means for bypassing said signal processing circuit.

4,841,462

RANDOM ACCESS MEMORY AND LINEAR INTERPOLATION CIRCUIT COMPRISING APPLICATION THEREOF

Jean-Pierre Vigarié, Cesson Sevigne; Jean-Claude Carlach, and Pierre Penard, both of Rennes, all of France, assignors to Etat Francais, Administration des P.T.T. (Centre National d'Etudes des Telecommunications), Issy les Moulineaux and Etabilissement Public dit "Telediffusion de France", Montrouge, both of, France

Filed Nov. 21, 1985, Ser. No. 800,413

Claims priority, application France, Nov. 21, 1984, 84 17738

Int. Cl.[4] G06F *7/38;* G11C *7/00;* H01L *27/02*

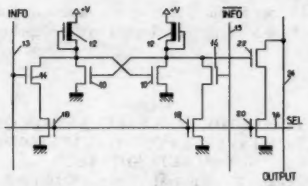
U.S. Cl. 364—723 **8 Claims**

1. A fast read-write memory for integration on a semiconductor substrate, having a plurality of memory points wherein each memory point has

a set-reset flip-flop having two metal-oxide-semiconductor storage transistors, whose drains are grounded and whose sources are connected to a voltage source through respective load transistors,

a metal-oxide-semiconductor output transistor having a grid connected to the source of one of said storage transistors and having a source connected to a read-out output line,

two input data lines arranged to receive complementary binary data each connected to the grid of a respective one of a pair of MOS switch transistors whose source is connected to the source of a respective one of said storage transistors,



a pair of first control transistors each having a grounded drain and a source which is connected to the drain of a respective one of said switch transistors and a second control transistor having a grounded drain and a source which is connected to the drain of the output transistor,

and a selection line connected to the grids of all said control transistors.

4,841,463

NONRECURSIVE DIGITAL FILTER

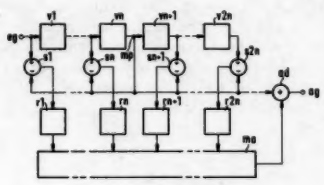
Soenke Mehrgardt, March, and Bernhard Ehret, Freiburg, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 75,024

Claims priority, application European Pat. Off., Aug. 7, 1986, 86110932.0

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724.16 **5 Claims**



1. A nonrecursive digital filter comprising:

a first group of delay elements and a second group of delay elements, all of said delay elements being connected in series and each of said delay elements providing a delay approximately equal to the period of a clock signal or a multiple of the period of said clock signal;

a center tap connected between said first and said second groups of said delay elements;

a first group of subtracters and a second group of said subtracters, each of said subtracters being associated with a respective one of said delay elements, the minuend input of each of said subtracters in said first group being connected to the input of a respective one of said delay elements in said first group, the minuend input of each of said subtracters in said second group being connected to the output of a respective one of said delay elements in said second group, and the subtrahend input of each of said subtracters being connected to said center tap;

a plurality of read-only memories, the address input of each of said read-only memories being connected to the output

of a respective one of said subtracters, each of said read-only memories containing the function e=bd, where d is the output signal of said respective one of said subtracters and b is a value responsive to the difference between the signal value at said center tap and the minuend input of said respective one of said subtracters;

a first adder having a plurality of inputs each of which is connected to a respective one of the outputs of said read-only memories; and

a second adder having a first input connected to said center tap and a second input connected to the output of said first adder.

4,841,464

CIRCUIT FOR THE FAST CALCULATION OF THE DIRECT OR INVERSE COSINE TRANSFORM OF A DISCRETE SIGNAL

Jacques Guichard, 8 rue des Morillons, 75015 Paris, and Eric Cassimatis, 4 pl de Barcelone, 75016 Paris, both of France

Filed May 20, 1986, Ser. No. 865,108

Claims priority, application France, May 22, 1985, 85 07717

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—725 **13 Claims**

10. A circuit for the fast calculation of the inverse cosine transform (x_i), $0 \leqq i \leqq N-1$ of a discretized signal defined by a sequence (X_i), $0 \leqq i \leqq N-1$, in which $N=2^n$ and n is a number equal to or greater than 4, wherein said circuit comprises a group of upper half-stages receiving a sequence (X_{2q}), $0 \leqq q \leqq (N/2)-1$ of even index components of the cosine transform and supplying a first sequence (x_j^o), $0 \leqq j \leqq (N/2)-1$, a group of lower half-stages receiving a sequence (X_{2q+1}), $0 \leqq q \leqq (N/2)-1$ of the odd index components of the cosine transform and supplying a second sequence (x_j^1), $0 \leqq j \leqq (N/2)-1$, and a final adder stage receiving the first sequence (x_j^o) and the second sequence (x_j^1) and supplying a sequence (x_j), $0 \leqq j \leqq N-1$, each upper half-stage, each lower half-stage and the final adder stage respectively performing the reverse cosine mathematical operation.

4,841,465

TRANSFORMATION CIRCUIT ARRANGEMENT

The A. Vuong, Stuttgart, Fed. Rep. of Germany, assignor to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP86/00578, § 371 Date Jun. 16, 1987, § 102(e) Date Jun. 16, 1987, PCT Pub. No. WO87/02489, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 9, 1986, Ser. No. 69,445

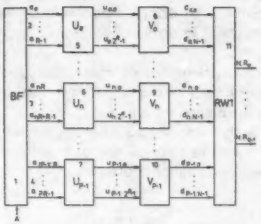
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536773

Int. Cl.[4] G06F *15/332*

U.S. Cl. 364—725 **14 Claims**

1. Circuit arrangement for the transformation of a first unknown vector with the aid of a matrix, comprising:

the matrix is constructed in such a manenr that the rows of said matrix contain a second, known vector which is cyclically shifted by rows; both the first, unknown vector and said second, known vector have the same length; said first vector is divided into a plurality of partial vectors; each said partial vector is output to an addition circuit and to a logic linkage circuit connected to the output of the respective said addition circuit; and the output of each respective said linkage circuit is output to a calculating



unit which produces the transform of said first unknown vector as a result.

4,841,466

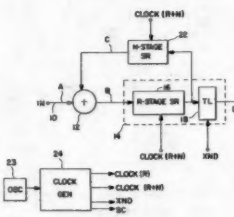
BIT-SERIAL INTEGRATOR CIRCUITRY

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Aug. 24, 1987, Ser. No. 88,340

Int. Cl.[4] G06F *7/50*

U.S. Cl. 364—733 **6 Claims**



1. A bit-serial integrator circuit for integrating a bit-serial signal comprising:

a signal input terminal for applying a bit-serial signal;

combining means for combining bit-serial signals, having a first input terminal coupled to said signal input terminal, a second input terminal and an output terminal;

a first serial shift register having R stages, R being an integer, an input terminal coupled to the output terminal of said combining means, an output terminal and a clock input terminal;

a second serial shift register having N stages, N being an integer, an input terminal coupled to the output terminal of said first serial shift register, an output terminal coupled to the second input terminal of said combining means, and a clock input terminal;

means for applying a burst of clock pulses to the clock input terminals of said first and second serial shift registers, the pulses in said burst being synchronous with occurring bits of said bit-serial signal, and the number of pulses in said burst being at least R+N per sample period; and

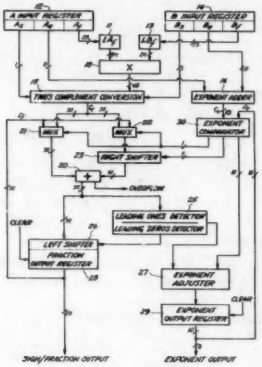
transparent latch means, having a signal input coupled to the output terminal of said first serial shift register for passing sample bits during a first predetermined portion of said burst and latching and outputting a predetermined sample bit for the duration of each sample period following said predetermined portion.

4,841,467

ARCHITECTURE TO IMPLEMENT FLOATING POINT MULTIPLY/ACCUMULATE OPERATIONS

Chung-Yih Ho, Schenectady; Karl J. Molnar, Clifton Park, and Daniel A. Staver, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,453
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—748 11 Claims



1. A system for multiplioation of successive pairs of floating point binary numbers and for accumulation of the products from such multipliction to generate a running result, each of said floating point numbers comprising a sign filed and a fraction field that express a signed magnitude and further comprising an exponent field, said system comprising:

means for temporarily storing the previous value of said running result, when such there is, including

means for temporarily storing a two's complement number descriptive of the sign field and fraction field of said previous value of said running result, and including

means for temporarily storing an exponent field of said previous value of said running result, which exponent field is associated with the temporarily stored two's complement number;

means responding to the fraction fields of each said successive pair of floating point binary numbers for generating a respective product of a respective pair of quantities, one of which respective quantities is integer one plus a fraction that is the fraction field of one of said successive pair of floating point binary numbers, and the other of which respective quantities is integer one plus a fraction that is the fraction field of the other of said successive pair of floating point binary numbers, said standard form being integer one plus a fraction;

means responding to the exponent fields of each successive pair of floating point binary words for determining an exponent field associated with the product generated from their fraction fields;

means responding to the sign fields of each said pair of floating point binary numbers for converting each said respective product to a two's complement number with which the exponent field associated with the product is also associated;

means for aligning the resulting two's complement number descriptive of the product and the temporarily stored two's complement number, by shifting the one of those two's complement numbers having a lower exponent field associated therewith than the other of those two's complement numbers;

means for adding the aligned two's complement numbers as received at respective ones of a first input port thereof and a second input port thereof, to generate a sum in two's complement form at an output port thereof;

means normalizing the sum for generating a replacement two's complement number used to replace the two's complement number descriptive of the sign field and fraction field of said previous value of said running result in said means for temporarily storing a two's complement number, said means normalizing the sum including

means for determining the number of sign bit repetitions in said sum and including

first data shifter means for shifting said sum by that number of bits towards increased significance to generate said replacement two's complement number; and

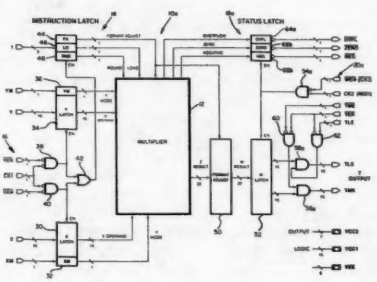
means for adding the number of sign bit repetitions to the larger of the exponent fields respectively associated with the product and associated with the previous value of the running result, thereby generating a replacement exponent field used to replace the exponent field of said previous value of said running result in said means for temporarily storing same.

4,841,468

HIGH-SPEED DIGITAL MULTIPLIER ARCHITECTURE

Bruce E. Miller, Aloha, Oreg., and Robert E. Owen, Saratoga, Calif., assignors to Bipolar Integrated Technology, Inc., Beaverton, Oreg.

Filed Mar. 20, 1987, Ser. No. 28,360
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—754 35 Claims



1. In an integrated circuit, a mulitiplier architecture comprising:

first data input means for inputting a binary X-operand comprising an array of M parallel bits wherein M is an integer greater than or equal to 1;

second data input means for inputting a binary Y-operand comprising an array of N parallel bits wherein N is an integer greater than or equal to 1;

binary multiplier means for multiplying the X-operand and the Y-operand to produce a binary product comprising an array of M+N parallel bits;

means for inputting a load instruction into the multiplier means;

load means in the multiplier means responsive to the load instruction for concatenating the X operand and Y operand without multiplying said operands to produce, as said product, a concatenated result in which the M most significant bits are the X operand and the N least significant bits are the Y operand;

and output means for outputting the product.

4,841,469
MATRIX TIMES MATRIX MULTIPLIER

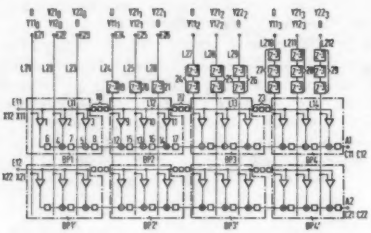
Ronald Kuenemund, Unterhaching, and Tobias Noll, Neufahrn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 222,937

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729175

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—754 **2 Claims**



1. A circuit for the multiplication of the elements of a multiplicand matrix represented by digital signals by the elements of a multiplier matrix represented by digital signals, characterized in that a first multiplicand line comprises a plurality of sections (**L11** . . . **L14**), an input (**E11**) is supplied with the digital signals that represent the elements of the first row of the multiplicand matrix at a prescribed sampling rate; a first section (**L11**) of the said plurality of sections of said first multiplicand line is connected to a first bit-associated circuit (**BP1**) associated with the least-significant bits of the elements of the multiplier matrix, said first bit-associated circuit formed of a plurality of multiplier lines (**L21** . . . **L23**) which receive said bits, said plurality of multiplier lines corresponding to the number of elements of a matrix row of the multiplier matrix increased by the number of rows of the matrix diminished by 1, said first bit-associated circuit further including a plurality of partial product stages (**1, 2, 3**) individually connected to the multiplier lines (**L21** . . . **L23**), the first inputs of said partial product stages connected to the first section (**L11**) of the first multiplicand line and the second inputs thereof being respectivly connected to the multiplier lines (**L21** . . . **L23**), and said first bit-associated circuit including a first iterative circuit of adders (**4, 5**) and respectively alternately connected time delay elements (**6** . . . **8**), and the outputs of said partial product stages are connected to inputs of said adders (**4, 5**); and each further section (**L12**) of the first multiplicand line is connected to a further, similarly constructed, bit-associated circuit (**BP2**) which is respectively associated with a more-significant bit of the elements of the multiplier matrix, and every every further section (**L12**) of the first multiplicand line is connected through a delay chain (**18**) to the respectively preceding section (**L11**) which cause a delay which is established by the iterative circuit of the bit-associated circuit (**BP1**) connected to the preceding section (**L11**), and time-delay elements (**19** . . . **21**) connected in the multiplier lines (**L24** . . . **L26**) of every further bit-associated circuit (**BP2**), and the time delay of said delay elements equaling the sum of all delays (**18**) which are inserted into the allocated and all preceeding sections (**L12, L11**) of the first multiplicand line, and the further iterative circuit of adders (**12** . . . **14**) comprising respectively interposed time delay elements (**15** . . . **17**) of every further bit-associated circuit (**BP2**) is connected to the output of the corresponding iterative circuit of the immediately preceding, bit-associated circuit (**BP1**); first digital signals of the output that represent the elements of the first roll of the product matrix occuring at the output of the iterative circuit of the bit-associated circuit (**BP4**) for the most significant bits of the elements of the multiplier matrix, further multiplicand lines comprising a plurality of sections respectively allocated to the further rows of the multiplicand matrix and their inputs (**L12**) being supplied with digital signals which represent the elements of the further rows of the multiplicand matrix and supplied at the said sampling rate; the individual sections of every further multiplicand line connected to bit-associated circuits (**BP1'** . . . **BP4'**) the same as the corresponding sections (**L11** . . . **L14**) of the first multiplicand line; further digital signals of the output of the elements of the further rolls of the product matrix occur at the outputs of the iterative circuits of the bit-associated circuits (**BP4'**) for the most significant bits of the elements of the multiplier matrix, and such bit-associated circuits connected to the last sections of the further multiplicand lines and the time delay elements (**6, 7, 8, 15, 16, 17**) connected between the adders (**4, 5, 12, 13, 14**) of the individual iterative circuits each providee delays which correspond to a clock period of the digital signal supplied to the inputs (**E11, E12**) of the multiplicand lines.

4,841,470
SURFACE ACOUSTIC WAVE DEVICE FOR DIFFERENTIAL PHASE SHIFT KEYING CONVOLVING

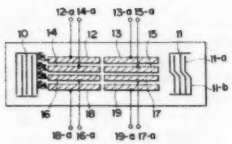
Takeshi Okamoto; Teruo Niitsuma, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion, Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,855

Claims priority, application Japan, Jun. 25, 1985, 60-139968; Jun. 27, 1985, 60-139074; Jun. 27, 1985, 60-139075; Jun. 27, 1985, 60-139073

Int. Cl.[4] G06G *7/12;* **H03H** *9/00*

U.S. Cl. 364—821 **21 Claims**



1. A differential phase shift keying convolver comprising:

a piezoelectric substrate;

two input transducers provided at spaced locations on one surface of said substrate and opposed to each other, one of said transducers generating first and second surface acoustic waves which travel toward the other of said transducers along respective traveling paths and which have different phases; and

output gate means provided between said input transducers along each said traveling path of surface acoustic waves for producing output gate signals which are a convolution of input signals generated by said input transducers, said output gate means including a plurality of pairs of output gates in which said gates of each said pair are disposed along a respective said traveling path and have therebetween a space which is located approximately in the center of the path of travel.

4,841,471
SYSTEM FOR CONVERTING ANALOG SIGNALS TO A DISCRETE REPRESENTATION WITHOUT ALIASING

Edwin A. Sloane, Los Altos, Calif., assignor to Schlumberger Technologies, Inc., San Jose, Calif.

Filed Apr. 10, 1987, Ser. No. 36,763

Int. Cl.[4] G06G *7/02*

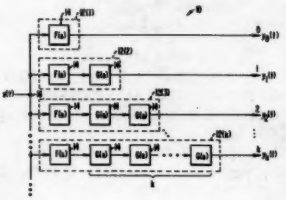
U.S. Cl. 364—825 **6 Claims**

1. A method for calibrating a system for correcting transfer functions of a non-ideal series filter network comprising:

providing a filter network of non-ideal filter elements, having an input port for receiving a test signal and having J ordered output ports for generating J ordered output signals at respective output ports, with the ratio of ampli-

tudes of successive output signals for a given frequency component being a first constant and with a difference of phases of successive output signals for a given frequency component being a second constant;

providing a correction network having J ordered input ports, K ordered output ports, K ordered summing elements coupled to respective output ports, and J×K correction elements, w_{jk}, each w_{jk} coupling a jth input port to the kth summing element and having an adjustable correction weight;



coupling each of said J ordered ports to a respective one of said J ordered input ports;

determining the value of an error matrix, E, defining an error between the transfer functions of the set non-ideal filter elements and the transfer functions of a set of ideal filter elements;

determining a value of the elements c_{ij}, of the matrix $(I+E)^{-1}$ where I is the identity matrix; and

setting the correction weight of each weighting element, w_{jk}, equal to c_{ij} for j=i and k=j.

4,841,472

WORD PROCESSOR CAPABLE OF AUTOMATIC TILTING OF DOCUMENTS

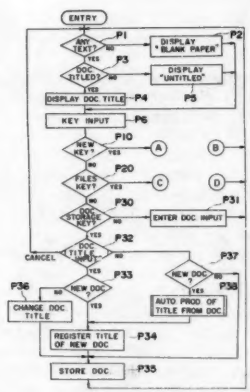
Koichi Izuhara, Osaka, Japan; Jeffrey L. Caruso, Concord, Mass., and Theodore C. Johnson, Seattle, Wash., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 729,309, May 1, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,336

Claims priority, application Japan, Apr. 22, 1986, 61-94298; Jul. 31, 1986, 61-181432

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—900 **16 Claims**



1. A word processor comprising:

a screen display means for displaying characters or the like on a screen;

a key input means for inputting the characters or the like of documents in the form of data including a title for a document and various commands;

a print means for printing document data of documents;

a document producing means for producing documents from data inputted from said key input means including a recording medium for receiving the document data and for outputting said document data to said print means;

means for permitting an operator to input a title to said document, produced by said document producing means, by the key input means in response to a first command from said key input means, and

a document management means for inputting, in accordance with a second command received from said key input means, document management data to a document management data area located at a determined position of said recording medium, and for outputting document management data stored in said recording medium to said screen display means, said document management data stored in said recording medium including titles of said documents stored in said recording medium and access data for filed corresponding to said documents; said document management means includes a title producing means for automatically producing, in response to the second command received when an untitled document is under processing, a title of said untitled document from a character string of a predetermined number of characters occupying a portion of said untitled document.

4,841,473

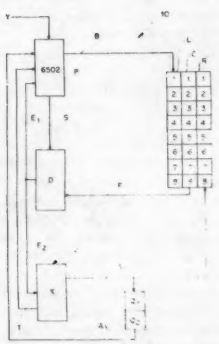
COMPUTER ARCHITECTURE PROVIDING PROGRAMMABLE DEGREES OF AN ALMOST CONDITION

Albert D. DePaul, New York, N.Y., assignor to Robert S. Salzman, Millington, N.J.

Filed Dec. 19, 1986, Ser. No. 943,424

Int. Cl.[4] G06K *9/68*; G06F *7/22*; H04N *5/14*

U.S. Cl. 364—900 **22 Claims**



1. A computer system having improved throughout and speed, comprising:

a processor having a data input and an address/data output;

a first set of memories each having separate data inputs, but sharing common addressing, said first set of memories being operatively connected to said processor;

a second set of template memories containing programmable data;

clocked address counter logic operatively connected to said processor and said template memories for generating sequential addresses for said set of template memories and end-of-address-range signal for said processor;

a set of variable comparators operatively connected with said first and second sets of memories, said variable comparators processing data from said first and second sets of memories and in response thereto, providing a set of data signals including an "almost" match signal; and

decoding logic means operatively connected to said set of variable comparators and communicating with said processor and said address counter logic for receiving and decoding said set of data signals and in response thereto, providing comparison signals for said processor and said clocked address counter logic.

4,841,474

COMPUTER SYSTEM WITH WORK STATIONS AT REMOTE POSITIONS AND RESERVE BATTERY POWER SUPPLY

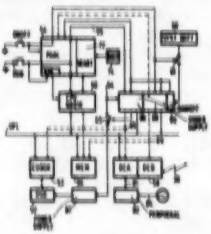
Frederik Zandveld, and Peter C. L. Van Der Vliet, both of Apeldoorn, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1985, Ser. No. 733,272

Claims priority, application Netherlands, May 18, 1984, 8401587

Int. Cl.[4] G06F *15/00, 11/30*

U.S. Cl. 364—900 **11 Claims**



1. A computer system comprising:

a central machine for processing data, said machine being adapted to be connected to a mains supply, said central machine including a volatile memory;

a plurality of user work stations coupled to said central machine for remote users to exchange data with said central machine;

reserve battery supply means connected to said central machine for temporarily supplying power to said volatile memory in the event said mains supply is interrupted;

said central machine having four separate states: an active state, in which data exchange by said central machine with any of said work stations, including processing at said central machine can be carried out; a standby state, in which data exchange cannot be carried out between any of said workstations and said central machine but in which the volatile memory is powered by the mains supply for retaining information; a battery supply state in which the volatile memory is temporarily powered by the reserve battery supply means for retaining information; and a rest state, during which the central machine and volatile memory are deactivated and information stored in the volatile memory is lost;

independently powered heart memory means operative during all said states for storing predetermined beginning and ending times for the active state and including real time clock means and means for setting said central machine in said active state during an active time period beginning at said beginning time and ending at said ending time;

each said workstation including user control means for generating an activate state request signal requesting to change the state of said central machine from said standby state to said active state;

means for generating a battery-was-off signal in the event power from said reserve battery supply means was interrupted during said battery supply state;

means, including said heart memory means, for storing indications of the condition of said computer system including said battery-was-off signal and an indication of whether an activate state request signal has occurred; and

logic means responsive to the presence of power from said mains supply for selectively placing said central machine in said active state or said standby state based on inspection of said stored condition indications including means for initiating an initial program load if said mains supply power reappears during said active time period and said battery-was-off signal is present.

4,841,475

DATA TRANSFER SYSTEM AND METHOD FOR CHANNELS WITH SERIAL TRANSFER LINE

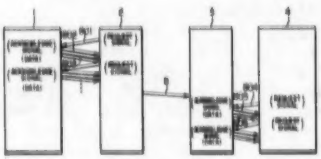
Takuo Ishizuka, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

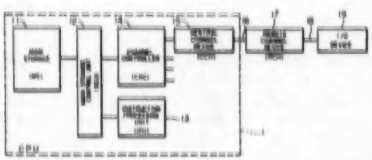
Filed Sep. 26, 1986, Ser. No. 911,785

Claims priority, application Japan, Oct. 1, 1985, 60-218902

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 **8 Claims**





1. A data input/output control system for controlling data chaining transfers comprising:

(a) a data processing unit for performing data processing and data transfer in accordance with instructions being executed by said data processing unit;

(b) a main storage connected to said data processing unit for storing data and said instructions including chaining instructions;

(c) a channel controlled connected to said main storage for controlling a plurality of input/output data channels using chaining instructions read from said main storage, said channel controller being operated in response to said chaining instructions read from said main storage, and said chaining instructions being outputted by said data processing unit to said main storage;

(d) at least one transfer line for serially transferring data from said main storage;

(e) at least one data input/output device connected to said at least one transfer line;

(f) each input/output data channel includes at least one central channel means connected between said at least one transfer line and said channel controller for sending a chaining instruction from said channel controller to said at least one transfer line, said channel controller being operated in response to said chaining instruction outputted by said data processing unit to said main storage operator, said data processing unit being operated in accordance

with said instructions being executed in said data processing unit, and said chaining instruction being indicative of whether data in said main storage at a plurality of addresses is to be chained and transferred to said at least one input/output device; and

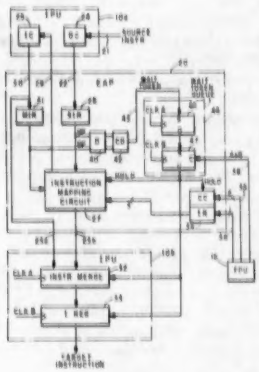
(g) remote channel means, connected between said at least one transfer line and said input/output device and responsive to said chaining instruction sent from said central channel means, for sending, after completion of a current data transfer, an instruction to said central channel means requesting a new data transfer command for a next data transfer.

4,841,476

EXTENDED FLOATING POINT OPERATIONS SUPPORTING EMULATION OF SOURCE INSTRUCTION EXECUTION

James A. Mitchell, and John F. Bechdel, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1986, Ser. No. 915,423
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—900 5 Claims



1. In a system for emulating the execution of source CPU instructions received from a computer external to said system, said system including a memory, a target instruction unit which processes and issues translated target instructions, target functional units for executing target instructions, and an instruction translating unit (translator) for receiving and translating said source instructions to translated target instructions, an improvement for accelerating said translating and issuing, said improvement comprising:

signal means in said translator for generating a floating point token signal in response to translation of a source floating point arithmetic instruction;

outcome means in said floating point unit for generating completion signals indicative of the outcome of the target floating point arithmetic instruction issued in response to said translation, said completion signals being generated in advance of completing the execution of said issued target floating point arithmetic instruction;

a multi-stage wait queue including a wait stage in said translator, said multi-stage wait queue connected to said signal and outcome means for receiving and moving said token signal to said wait stage in response to said translation and for removing said token signal from said wait stage in response to said completion signals; and

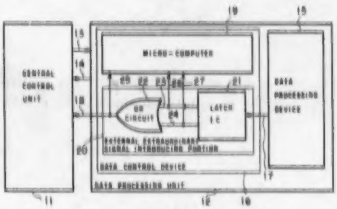
system means connected to said wait stage, said translator, and said target instruction unit for preventing the translation and issue of instructions until said token is removed from said wait stage.

4,841,477

RESPONSE/PROCESSING APPARATUS FOR EXTERNAL-ABNORMAL-STATE IN DATA PROCESSING SYSTEM

Masaharu Mizuta, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 917,824, Oct. 10, 1986, abandoned. This application Sep. 6, 1988, Ser. No. 240,470
Claims priority, application Japan, Dec. 27, 1985, 60-296042
Int. Cl.[4] G06F 13/14
U.S. Cl. 364—900 4 Claims



1. A data processing system comprising:

a data processing device installed in a data processing unit for processing prescribed data; and

a data control device installed in the data processing unit and having an external extraordinary signal introducing portion for introducing external abnormal signals outputted from the data processing device, and a microcomputer for performing transmission/receiving of a command signal and a response signal between the external extraordinary signal introducing portion and a central control unit based on the abnormal signals outputted from the external extraordinary signal introducing portion,

wherein said external extraordinary signal introducing portion is provided with a latch circuit for storing the external abnormal signals outputted from the data processing device and transmitting the external abnormal signals to the microcomputer, and an OR logic circuit for taking logical sum of the external abnormal signals latched by the latch circuit, said OR logic circuit having an output terminal connected both to the microcomputer and to the central control unit for outputting a control signal to the microcomputer and also for outputting an attention signal to the central control unit to inform the central control unit of an abnormal condition without interruption of processing by the microcomputer.

4,841,478

DOCUMENT PROCESSOR

Tsutomu Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 923,089
Claims priority, application Japan, Oct. 31, 1985, 60-244978
Int. Cl.[4] G06F 3/00
U.S. Cl. 364—900 15 Claims

1. A document processor comprising:

input means for inputting a document;

memory means for storing the document input by said input means;

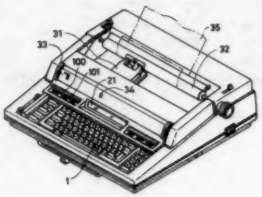
a first scale;

print means, having a scale indicator for indicating a printing position relative to said scale, for printing the document stored in said memory means onto a print medium in the direction of said first scale as indicated by said scale indicator;

display means for displaying a second scale corresponding to said first scale and for displaying characters to be printed; and

control means for controlling said print means such that the

document stored in said memory means is read out and printed, and for controlling said display means such that



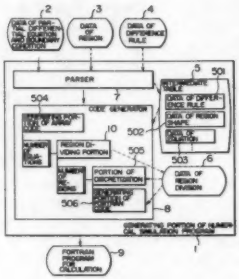
said second scale of said display means is displayed in correspondence with the characters to be printed.

4,841,479

METHOD FOR PREPARING A SIMULATION PROGRAM

Michiru Tsuji, Hino; Chisato Konno, Inagi, and Miyuki Saji, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 19, 1987, Ser. No. 16,406
Claims priority, application Japan, Mar. 14, 1986, 61-54762
Int. Cl.[4] G06F *3/02, 15/328*
U.S. Cl. 364—900 **2 Claims**



1. A method for automatically generating by use of a computer a simulation program for simulating a phenomenon in a region by discretizing automatically data of a partial differential equation inputted when the partial differential equation and boundary conditions governing the phenomenon and data representing the shape of a region, which is an object of calculation, are given, by using a discretization rule by the finite differential method, and for generating a program calculating numerical values representative of the phenomenon determined by said partial differential equation over the whole object region of calculation by the finite differential method on the basis of the equation after the discretization, said method comprising the steps of:

dividing said object region of calculation into a plurality of blocks, each of which has the same differential equation and the same discretization rule; and

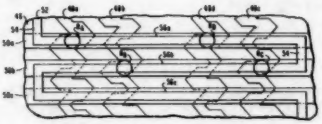
generating a program which calculates, for each of said blocks numerical values representative of the phenomenon determined by the partial differential equation and the discretization rule both applied for each of the blocks by the finite differential method.

4,841,480

CROSS-TIE MEMORY SYSTEM

Donald R. Lampe, Ellicott City, Md.; Mark A. Mentzer, Lititz, Pa., and Eric H. Naviasky, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 795,284, Nov. 5, 1985, Pat. No. 4,722,073. This application Oct. 9, 1987, Ser. No. 107,122
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—87 **17 Claims**



1. A magnetoresistive random access cross-tie memory array comprising:

a. an insulating substrate;

b. a plurality of spaced columns of thin film magnetoresistive material disposed upon said substrate, said thin film columns being symmetrically patterned and shaped to provide only two stable magnetic domain states at spaced memory elements which form and X-Y array of spaced-apart memory elements magnetically addressable to one of two possible stable states;

c. row conductors aligned over row-aligned pairs of memory elements;

d. serpentine-shaped column conductors having column-extending portions interconnecting row-aligned extending portions, each said serpentine-shaped column conductor arranged so that adjacent row-aligned extending portions of said column conductor conduct current in opposed directions over row-adjacent memory elements;

e. a single binary digit being written and stored at four of said memory elements defined on four adjacent columns of magnetoresistive material, with one memory element of the four being located along each of said four columns of magnetoresistive material, with two of said four memory elements aligned under a first row conductor, and the other two memory elements aligned under a second row conductor;

f. said four memory elements being aligned under one of said serpentine column conductors, with two of said four memory elements aligned under said first row conductor being further aligned under a first row-aligned extending portion of said one serpentine column conductor, and the other two of said four memory elements aligned under said second row conductor being further aligned under a second row-aligned extending portion of said one serpentine column conductor; and

g. wherein signals passed through said first and second row-aligned extending portions of said one serpentine column conductor are complementary signals.

4,841,481

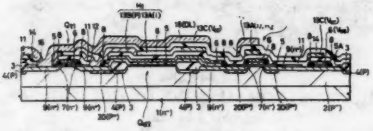
SEMICONDUCTOR MEMORY DEVICE

Shuji Ikeda, Koganei; Satoshi Meguro, Hinode; Kotaro Nishimura; Sho Yamamoto, both of Kodaira, and Nobuyoshi Tanimura, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 899,404, Aug. 22, 1986, Pat. No. 4,774,203. This application Jul. 28, 1988, Ser. No. 225,467
Int. Cl.[4] G11C *11/00, 7/00;* **H03K** *3/284;* **H01L** *29/78*
U.S. Cl. 365—154 **6 Claims**

1. A semiconductor memory device having a memory cell including a flip-flop composed of first and second inverters, the output terminals of said first and second inverters being respectively connected to the input terminals of said second and first inverters, each of said first and second inverters being consti-

tuted by a MISFET and a load element which is connected in series to said MISFET and which is formed by a polysilicon film, said polysilicon film including a first region of a first conductivity type, a second region of a second conductivity type, and a third region having no impurities of said first and second conductivity types introduced therein and defining said



load element, said first region being formed on the side of said polysilicon film which is closer to the end thereof to which a power supply voltage is applied than at least said second and third regions, and said second region being formed on the side of said polysilicon film which is closer to said MISFET than at least said third region.

4,841,482

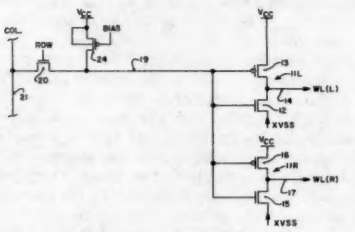
LEAKAGE VERIFICATION FOR FLASH EPROM

Jerry A. Kreifels, Citrus Heights, and George Hoekstra, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 17, 1988, Ser. No. 157,364

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—185 **6 Claims**



1. An electrically erasable and electrically programmable read-only memory fabricated on a silicon substrate and employing a plurality of memory cells each of which has a floating gate, an improvement for verifying leakage current from said memory cells comprising:

circuit means incorporated on said substrate for providing a first reference voltage and a second reference voltage onto word lines coupled to a control gate of each of said memory cells, wherein said first reference level is coupled to said word line under normal operation, but during a test verification mode, said circuit means provides said second reference level onto said word line such that a current measurement device coupled to drains of said memory cells measures leakage current from said cells, said leakage current being above a predetermined value if a given cell is leaky and susceptible to being overerased.

4,841,483

SEMICONDUCTOR MEMORY

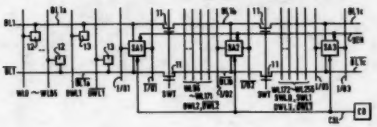
Tohru Furuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 9, 1987, Ser. No. 130,568

Claims priority, application Japan, Dec. 15, 1986, 61-298398

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—189.07 **12 Claims**



1. A semiconductor memory having a plurality of memory cells and a bit line connected to the memory cells, comprising:

the bit line being formed of a plurality of sub-bit lines,

switch means for interconnecting and disconnecting the sub-bit lines, said switch means including respective switching elements which interconnect the sub-bit lines,

reference potential means for storing reference potentials, and

sense amplifier means for comparing the output of an addressed memory cell with the reference potentials, whereby the memory is capable of storing n-valued data using n different storage potentials.

4,841,484

TRI-STATE IIL GATE

Kazuo Watanabe, Takasaki; Makoto Furihata, Gunma, and Kouichi Yamazaki, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,694

Claims priority, application Japan, Feb. 25, 1985, 60-34341; Feb. 25, 1985, 60-34342; Apr. 24, 1985, 60-86373; Apr. 24, 1985, 60-86398

Int. Cl.[4] H03K *19/02, 19/092;* G11C *11/00*

U.S. Cl. 365—190 **25 Claims**

10. A semiconductor integrated circuit device comprising:

a power supply terminal for supplying an operating voltage to said semiconductor integrated circuit device;

a current source coupled to said power supply terminal;

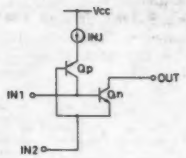
a plurality of tri-state gates being interconnected within said semiconductor integrated circuit deice, each tri-state gate having an input terminal, at least one output terminal and a control terminal, and each of said plurality of tri-state gates further including first and second bipolar transistors, said first bipolar transistor having a base coupled to said input terminal, an emitter coupled to said control terminal and at least one collector coupled to said at least one output terminal, said second bipolar transistor having an emitter coupled to said current source, a base coupled to said control terminal and a collector coupled to said input terminal;

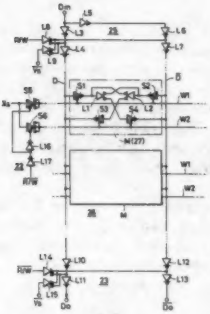
wherein said output terminal of each tri-state gate becomes a floating condition regardless of an input signal applied to said input terminal when a control signal applied to said control terminal have a first level so that said first and second bipolar transistors are turned off,

and wherein each tri-state gate provides a signal having a selected one of a high or low level in response to the input signal applied to said input terminal when the control signal applied to said control terminal have a second level so that said second bipolar transistor is turned on and said first bipolar transistor is in either an on or off state in response to the input signal;

wherein said plurality of tri-stat gates are collectively provided in an island region formed in a semiconductor substrate, wherein the control terminals of said plurality of

tri-state gates are constituted by said island region, and wherein said plurality of tri-state gates are commonly





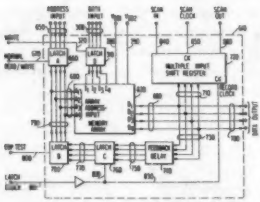
controlled by a potential level of said first island served as the control signal.

4,841,485

READ/WRITE MEMORY DEVICE WITH AN EMBEDDED READ-ONLY PATTERN AND METHOD FOR PROVIDING SAME

Ronald J. Prilik, South Burlington, and James R. Varner, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1987, Ser. No. 116,818
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—201 **21 Claims**



1. A memory array device with an embedded binary pattern, said memory array device comprising:

a first voltage line and a second voltage line;

an array of bistable memory cell means, each of said bistable memory cell means being associated with a respective address value and being constructed with first and second sides that each are selectively connectable to said first voltage line or said second voltage line, each of said bistable memory cell means, when said first and second sides are selectively connected to opposite ones of said first and second voltage line, being for:

(a) functioning, during times when said first and second voltage lines are energized at a same time and voltage level, in a bistable mode; and

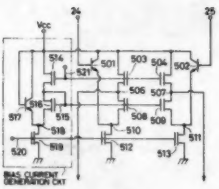
(b) functioning, during times when said first and second voltage lines are energized at at least one of different times and different voltage levels, in an embedded binary pattern mode wherein each of said bistable memory cell means being set to a logical value corresponding to a selected connection of said first and second sides of said bistable memory cell means to said first and second voltage lines.

4,841,486

SEMICONDUCTOR MEMORY DEVICE AND SENSE AMPLIFIER

Osamu Minato; Toshiaki Masuhara; Koichiro Ishibashi, all of Tokyo; Shoji Hanamura, Kokubunji; Shigeru Honjyo, Hachioji, and Nobuyuki Moriwaki, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,776
Claims priority, application Japan, Dec. 27, 1985, 60-292899
Int. Cl.[4] G11C *7/00, 11/42*
U.S. Cl. 365—207 **19 Claims**



1. A semiconductor memory device having a memory plane defined by a plurality of memory cells, a decoder for accessing said memory cells, a data line on which a signal output from an accessed memory cell is transmitted, and a sense amplifier for amplifying the signal transmitted on said data line,

said sense amplifier comprising:

first and second common-collector bipolar transistors, wherein the collectors are supplied with a predetermined first operating potential and the bases of which are differentially driven by a differential input signal from said accessed memory cell;

first and second P-channel MOSFETs, wherein the sources are respectively coupled to the emitters of said first and second common-collector bipolar transistors and the gates of which are supplied with a predetermined bias voltage;

first and second N-channel MOSFETs, wherein the sources are supplied with a second operating potential, the drains of which are respectively coupled to the drains of said first and said second P-channel MOSFETs, the gates of which are coupled to each other, and wherein said first and second N-channel MOSFETs include a source-drain current path operating as an input current path and an output current path, respectively, of a current mirror circuit; and

a first sense output signal is provided at a first circuit node at the coupling of said drain of said second P-channel MOSFET and said drain of said second N-channel MOSFET.

4,841,487

SEMICONDUCTOR MEMORY DEVICE WITH ADDRESS GENERATOR

Shigeki Demura, and Toshio Oura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,983
Claims priority, application Japan, Feb. 27, 1987, 62-45742
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—230.01 **15 Claims**

14. A microprogram control unit incorporated in a microcomputer fabricated on a semiconductor chip, said micro-

program control unit performing a read-out operation, comprising:

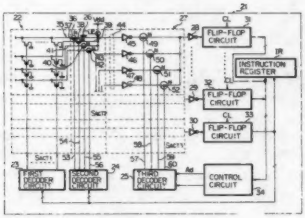
(a) a memory cell array having a plurality of memory cells arranged in rows and columns, each of said memory cells having a metal-insulator-semiconductor structure fixedly storing a data bit depending upon a thickness of the insulator, said rows being grouped by four to form a plurality of memory cell groups;

(b) a first decoder circuit operative to produce a first activation signal for reading out said data bits each selected from each of said rows;

(c) a second decoder circuit operative to produce a second activation signal of a positive high voltage level;

(d) a first selector module having a plurality of first selector circuits equal in number to said memory cell groups, each of said first selector circuits being provided with four transfer gates coupled in parallel to said four rows of each memory cell group, each first selector circuit being responsive to said second activation signal so as to allow said one of said data bits selected from each memory cell group to pass therethrough, said first selector circuits being grouped by four to form a plurality of first selector groups;

(e) a third decoder circuit operative to produce a third activation signal of a positive high voltage level;



(f) a second selector module having a plurality of second selector circuits equal in number to said first selector groups, each of said second selector circuits being provided with four series combinations each consisting of a buffer circuit and a transfer gate, each second selector circuit being responsive to said third activation signal to allow one of said data bits selected from said first selector groups to pass therethrough;

(g) a plurality of buffer circuits each coupled to each of said second selector circuits;

(h) a plurality of clocked flip-flop circuits each coupled to said each of said buffer circuits and responsive to a clocked pulse so as to latch said data bit fed from said buffer circuit coupled to each second selector circuit, all of said data bits latched by said clocked flip-flop circuits being transferred to an instruction register, a part of said data bits latched by said clocked flip-flop circuits being transferred to said first and second decoder circuits for producing said first and second activation signals; and

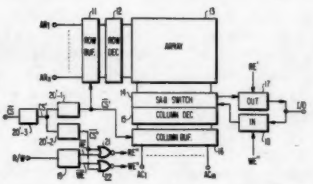
(i) a microprogram sequencer operative to execute a predetermined function for producing an internal address signal on the basis of remaining data bits, said internal address signal being supplied to said third decoder circuit for producing said third activation signal.

4,841,488

SEMICONDUCTOR MEMORY CIRCUIT WITH IMPROVED TIMING AND DELAY CONTROL FOR DATA READ OUT

Kohji Sanada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 36,765
Claims priority, application Japan, Apr. 8, 1986, 61-81711
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—233 **5 Claims**



1. A memory circuit comprising:

an array of memory cells;

a selection circuit for operatively selecting at least one of the memory cells;

an output terminal;

an output circuit having an input end and an output end, said output end being coupled to said output terminal, said output circuit operatively generating, when enabled, and output signal at said output terminal in accordance with a level at the input end, and said output circuit setting, when disabled, said output terminal at a high impedance state;

first means, coupled to said selection circuit and said input end of said output circuit, for applying a data signal derived from the selected memory cell to said input end of said output circuit;

second means receiving an external control signal assuming one of active and inactive levels;

first and second control signal generators each coupled to said second means, said first and second control signal generators generating first and second active level control signals with first and second delay times, respectively, when said external control signal changes to an active level, and generating first and second inactive control signals with third and fourth delay times, respectively, when said external control signal changes to an inactive level, said first delay time being shorter than said second delay time, and said fourth delay time being shorter than said third delay time;

third means coupled to said first control signal generator and said selection circuit, said third means enabling said selection circuit in response to the active level of said first control signal, and disenabling said selection circuit in response to the inactive level of said first control signal; and

fourth means coupled to said second control signal generator and said output circuit, said fourth means enabling said output circuit in response to the active level of said second control signal, and disenabling said output circuit in response to the inactive level of said second control signal.

2. A memory circuit comprising:

an array of memory cells;

a selection circuit for operatively selecting at least one of the memory cells;

an output terminal;

an output circuit having an output end coupled to said output terminal, and an input end, said output circuit operatively producing at said output terminal, data corresponding to a signal at the input end thereof when said output circuit is enabled, and said output circuit setting said output terminal in a high impedance state when said output circuit is disabled;

means, coupled to said selection circuit and said output

circuit, for supplying the input end of said output circuit with a signal derived from the memory cell selected by said selection circuit;

first means for receiving an external control signal having one of an active and an inactive level;

a first series circuit having a first field effect transistor connected between a first voltage line supplied with a first voltage and a first node, and a second field effect transistor connected between said first and a second voltage line supplied with a second voltage, a conductance of said first transistor being smaller than that of said second transistor;

a second series circuit having a third field effect transistor connected between said voltage line and a second node, and a fourth field effect transistor connected between said second node and said second voltage line, a conductance of said third transistor being larger than that of said fourth transistor;

second means coupled to said first means, said first series circuit and said second series circuit, said second means simultaneously rendering said second and fourth transistors conductive in response to the active level of said external control signal so that said second voltage is produced at said first node and thereafter produced at said second node, said second means simultaneously rendering said first and third transistors conductive in response to the inactive level of said external control signal so that said first voltage is produced at said second node and thereafter produced at said first node;

third means, coupled to said first node and said selection circuit, for enabling said selection circuit when said first node is approximately at said second voltage and disabling said selection circuit when said first node is approximately at said first voltage; and

fourth means, coupled to said second node and said output circuit, for enabling said output circuit when said second node is approximately at said second voltage and disabling said output circuit when said second node is approximately at said first voltage.

4,841,489

METHOD OF IMAGING AN OBJECT BY ULTRASONIC OR ELECTROMAGNETIC WAVES

Yoshihiko Ozaki; Hiroaki Sumitani; Toshimasa Tomoda; Fumihide Sato, and Kenji Kusano, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,481

Claims priority, application Japan, Dec. 27, 1985, 60-292763; Dec. 27, 1985, 60-292764; Dec. 27, 1985, 60-292768; Mar. 14, 1986, 61-57481; Mar. 14, 1986, 61-57482; Mar. 14, 1986, 61-57483

Int. Cl.[4] G03B *42/06*

U.S. Cl. 367—7 **15 Claims**

1. In a method of imaging an object wherein when a target object is imaged using ultrasonic or electromagnetic waves based on a synthetic aperture method to obtain an image of said target object by mechanically or electronically scanning an ultrasonic or electromagnetic wave transcieving system to transmit ultrasonic or electromagnetic waves which spread spacially in relation to said object, and to receive waves reflected from said target object, while obtaining an image of said target object by using a Time of Flight locus line along a direction of scanning prescribed by a phase delay in a received signal generated in a period from the transmission of waves to the reception of waves, wherein a method of imaging an object by ultrasonic or electromagnetic waves further comprises the steps of using a receive signal group from each of a plurality of scanning points within a range of a synthetic aperture to sequentially reproduce a line image of a central line of said synthetic aperture range, whereby an image of a target spatial area is sequentially produced while said ultrasonic or electromagnetic wave transceiver system is being scanned.

4,841,490

INVERSION OF A VERTICAL SEISMIC PROFILE BY MINIMIZATION OF AN ENTROPY LIKE FUNCTION

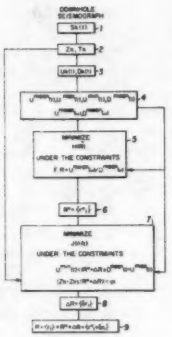
Didier Carron, Joinville, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 16, 1988, Ser. No. 208,183

Claims priority, application France, Jun. 19, 1987, 87 8592

Int. Cl.[4] G01V *1/28*

U.S. Cl. 367—38 **11 Claims**



1. A method of identifying underground geological strata from a plurality of seismic traces Sk(t) recorded in a borehole at different levels k of depth Zk, wherein each trace Sk(t) includes n discrete sample values sampled as a function of time t at a constant time interval Δt, the method determining the series $R=\{r_i$, for $i=1,n\}$ representative of seismic reflection coefficients at the interfaces formed between successive geological strata, wherein i is an index relating to the sampling depth on a time scale at the constant interval Δt, said method including the steps of:

establishing the time-depth curve relating the depth Zk to the transit time Tk recorded on the trace Sk(t) for each level k;

extracting the upgoing wavefield Uk(t) and the downgoing wavefield Dk(t) from the traces Sk(t); and

calculating $U^{mean}(t)$, $U^{min}(t)$, and $U^{max}(t)$ representative of mean value, minimum value, and maximum value, respectively, of the upgoing wavefield Uk(t−Tk), and calculating $D^{mean}(t)$, representative of mean value of the downgoing wavefield Dk(t+Tk);

said method further including the steps of:

(a) determining a series $R^o=\{r^o_i\}$, representative of an approximation to the series R, by minimizing the function

$$H(R)=\Sigma f(r_i)$$

wherein $f(r_i)$ is an increasing function of $|r_i|$, which is symmetrical on the X axis, concave, and satisfies the constraint

$$R*D^{mean}(t)=U^{mean}(t)$$

wherein the operator * represents a convolution product;

(b) determining a series $\Delta R=\{\delta r_i\}$ representative of a value for correcting the series R^o, and minimizing a function $J(\Delta R)$ which is linear in $|\delta r_i|$ under the constraints:

$$U^{min}(t)<[(R^o+\Delta R)*D^{mean}(t)]<U^{max}(t) \text{ and}$$

$$|Zk-Zks(R^o+\Delta R)|<\epsilon k$$

wherein $Zks(R^o+\Delta R)$ is a linearized function in ΔR representative of the depth Zks calculated synthetically at level k from the initial solution R^o and the magnitude ϵk is

representative of the uncertainty in the magnitudes of Zk and Tk; and

(c) calculating the series $R=R^o+\Delta R\{R_i=r^o_i+\delta r_i\}$ representative of seismic reflection coefficients.

4,841,491

ULTRASONIC BEAM FORMER

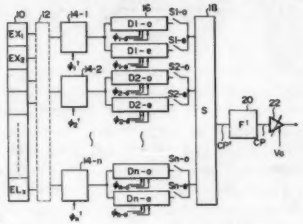
Shinichi Kondo, Kodaira; Kageyoshi Katakura; Toshio Ogawa, both of Tokyo; Shin'ichiro Umemura, and Hiroshi Ikeda, both of Hachioji, all of Japan, assignors to Hitachi Ltd. and Hitachi Medical Corp., both of Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,287

Claims priority, application Japan, Aug. 7, 1985, 60-173458; Dec. 11, 1985, 60-281423

Int. Cl.[4] G01S *15/06*

U.S. Cl. 367—103 **11 Claims**



1. An ultrasonic beam former comprising:

a plurality of receiving amplifiers for independently amplifying received signals of respective elements of a transducer array, the amplification factor of each of said receiving amplifiers being changed stepwise so that the gain increases with the elapse of time after each wave transmission;

a plurality of channels each having a plurality of sampling delay means for delaying by a different amount the output of each of said plurality of receiving amplifiers during a single signal reception period following each transmitted signal;

addition means for adding together outputs of said plurality of sampling means having corresponding delays; and

a time gain control amplifier for amplifying the output of said addition means, the amplification factor of said time gain control amplifier changing in a sawtooth wave form.

4,841,492

APODIZATION OF ULTRASOUND TRANSMISSION

Robert H. Russell, Manhattan Beach, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 5, 1987, Ser. No. 82,248

Int. Cl.[4] G01S *9/68*

U.S. Cl. 367—105 **9 Claims**

1. An apodization attenuation circuit to control the amplitude of pulses transmitted from each ultrasound transducer element in an array of N transducer elements comprising:

an aperture of m transmitting elements within said array wherein $1 \leqq m \leqq N$ with an acoustic axis passing through the center of said aperture;

means to focus the transmission of ultrasound energy from said elements within said aperture; and

means to shape the distribution of electrical energy applied across said m transmitting transducer elements such that the excitation energy decreases as a function of distance from the center and the variation of peak pressure among said transmitting elements if a function of lateral distance of each element to the axis of the transmitted beam of ultrasound energy which means include:

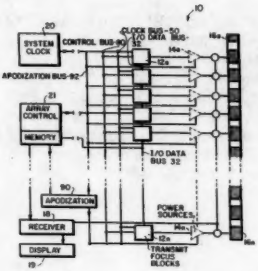
a two wire power supply;

means to determine which of said transducer elements are within said aperture;

a string of N resistors, one for each of said transducer elements, said N resistors being connected in series with the last resistor in said string being connected to the first to form a closed loop;

N driver circuits, each driver circuit being connected to energize a corresponding transducer element as a function of a reference potential input;

each interresistor node of said resistor string being connected to the driver circuit of a corresponding one of said transducer elements and functioning as the reference potential input for said driver circuit;



means to connect at least one node of said resistor string on each side of said acoustic axis within said aperture to a first potential of said power supply and at least one node of said resistor string on each side of said acoustic axis outside said aperture to a common potential of said power supply such that the reference potential input from said resistor string to each of said driver circuits approximates a selected Gaussian function.

4,841,493

ELECTRONIC ACOUSTIC SIGNAL EMITTER

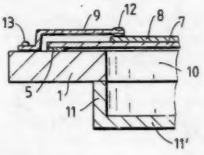
Alfred Meisner, Nuremberg; Erwin Potthof, Rothenbach, and Henry Fluhrer, Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 184,016

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3718018

Int. Cl.[4] H01L *41/08*

U.S. Cl. 367—140 **9 Claims**



1. An electronic acoustic signal emitter including a piezo-ceramic plate arranged on a metal membrane; and a circuit board supporting an actuating circuit comprising of electrical components, said electrical components of said actuating circuit connected by conductive paths on said circuit board, said electrical components of said actuating circuit electrically connected to a ring shaped conductive path on said circuit board of diameter generally equal to that of the metal membrane, said ring shaped conductive path forming a support for said metal membrane, the side of said metal membrane opposite said piezo-ceramic plate being electrically conductively fas-

tened to said circuit board at said ring shaped conductive path and concentric thereto, said electrical components and said metal membrane located on one side of said circuit board, and said circuit board including a radiation opening located beneath said metal membrane.

4,841,494

UNDERWATER PIEZOELECTRIC ARRANGEMENT

Hisao Banno, Tohkai, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan

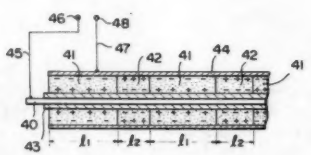
Filed Jun. 28, 1988, Ser. No. 212,676

Claims priority, application Japan, Jul. 3, 1987, 62-167588; Jul. 3, 1987, 62-167589

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[4] G01V *1/38*

U.S. Cl. 367—157 **9 Claims**



1. An underwater piezoelectric arrangement comprising at least one first and at least one second piezoelectric elements juxtaposed, said first piezoelectric element being made of a polarized ceramic-polymer composite having a first hydrophone constant and generating electrostatic charges of opposite polarities on the opposed surfaces thereof in response to stresses which act on said first piezoelectric element in a direction parallel to said surfaces thereof, said second piezoelectric element being made of a polarized ceramic-polymer composite having a second hydrophone constant smaller than said first hydrophone constant and generating electrostatic charges of opposite polarities on the opposed surfaces thereof in response to stresses which act on said second piezoelectric element in a direction parallel to said surfaces thereof, the levels of said charges generated on the surfaces of each of said piezoelectric elements in response to said stresses being substantially equal, electrode members provided on respective opposed surfaces of each of said first and second piezoelectric elements, said electrode member on the positive pole surface of said first piezoelectric element being electrically connected to said electrode member on the negative pole surface of said second piezoelectric element, said electrode member on the negative pole surface of said first piezoelectric element being electrically connected to said electrode member on the positive pole surface of said second piezoelectric element, and a pair of terminals connected to said electrode members on the positive pole surface of said first piezoelectric element and the negative pole surface of said second piezoelectric element and said electrode members on the negative pole surface of said first piezoelectric element and the positive pole surface of said second piezoelectric element for providing detection of an output signal produced in accordance with the difference between the respective hydrophone constants of said first and second piezoelectric elements only in response to acoustic waves being received by the arrangement and cancellation of noise signals produced in accordance with said charges on said first and second piezoelectric elements.

4,841,495

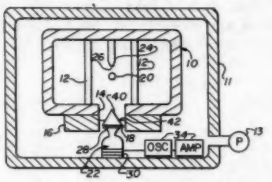
HORN LOADED TRANSDUCER FOR ACOUSTIC LEVITATION

Thomas J. Danley, Highland Park, and Charles A. Rey, Naperville, both of Ill., assignors to Intersonics Incorporated, Northbrook, Ill.

Filed Jun. 9, 1986, Ser. No. 871,924

Int. Cl.[4] G01K *15/00*

U.S. Cl. 367—191 **10 Claims**



1. In an acoustic levitation device wherein an object is levitated by acoustic energy from a sound source and is heated while being levitated, the improvement wherein said sound source comprises a dish-shaped member and means for flexing said dish-shaped member to produce sound at the outer perimeter of said member, and means for horn loading and protecting said sound source from heat, said last mentioned means comprising a hollow tube, said dish-shaped member being located in one end of the tube, a insulating member disposed in the tupe and being spaced from the tube and the dish-shaped member, said insulating member having a base coextensive with the dish-shaped member except for the outer perimeter thereof to insulate said dish-shaped member, said insulating member tapering away from the base thereof to provide horn loading for said sound source means.

4,841,496

APPLIANCE TIMER

George W. Adams, Greenwood; Steven W. Smock, and Ross G. Helft, both of Indianapolis, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

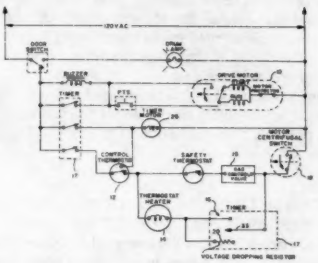
Filed Dec. 17, 1987, Ser. No. 134,166

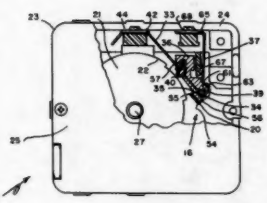
Int. Cl.[4] G04F *8/00*; H01H *43/10*

U.S. Cl. 368—107 **14 Claims**

1. In an appliance timer having a housing, a motor driven cam programming means carried in said housing, a switch blade responsive to said cam programming means, and a plurality of electrical switch circuit means for providing a plurality of operating levels for a function of said appliance, each switch circuit means comprising one or more of the following switch circuit components: said switch blade, a first contact mounted on said switch blade, second contact means for cooperating with said first contact means, support means for supporting said second contact means, a terminal mounted exteriorly of said housing, a housing feed-through, and a terminal strap, the improvement comprising a leadless resistor or capacitor electrically and mechanically attached directly to at least one of

said switch circuit components, said resistor or capacitor having a predetermined resistance or capacitance whereby it provides differentiation between said plurality of circuits means to provide said plurality of operating levels.



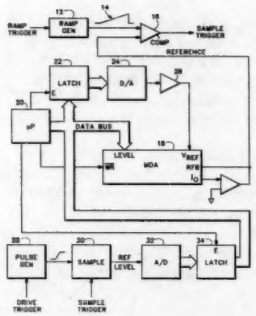


4,841,497

DIGITAL TIME BASE WITH CORRECTED ANALOG INTERPOLATION

Glenn Bateman, Redmond, Oreg., and Donald L. Brand, North Ridge, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 7, 1987, Ser. No. 129,619
Int. Cl.[4] H03K *13/20*
U.S. Cl. 368—113 **4 Claims**



3. A digital time base with analog interpolation comprising:

means for generating an analog ramp signal in response to a ramp trigger;

means for comparing the analog ramp signal with a signal level which varies between a zero value and a maximum value to establish an interval along the analog ramp signal; and

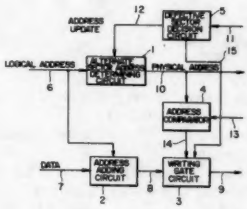
means for adjusting the maximum value so that the interval is a predetermined value.

4,841,498

INFORMATION RECORDING/REPRODUCING APPARATUS WITH MEANS FOR SUBSTITUTING PREDETERMINED GOOD SECTORS FOR DEFECTIVE ONES

Tatuo Sugimura, Yawata; Isao Satoh, Neyagawa; Yoshihiko Imai, Hirakata, and Makoto Ichinose, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 11, 1985, Ser. No. 710,216
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—32 **9 Claims**



1. An information recording and reproducing apparatus comprising:

means for recording information on a recording medium and reproducing the same therefrom, said recording medium having a recording/reproducing structure in which an information recording/reproducing region is divided into a plurality of addressable sectors;

means for providing a logical address for a sector designated for recording;

means for receiving said logical address and for designating a first physical address of said sector designated for recording;

means for detecting whether said sector designated for recording is defective;

means responsive to detection that the sector designated for recording is defective for designating an alternate recording sector to be used in place of the defective sector, said means for designating the alternate recording sector controlling said means for designating the first physical address so that said means for designating designates a second physical address of an alternate recording sector each time a defective recording sector is detected;

means for adding said logical address to recordable data to form an address-added data signal having a logical address portion and a data portion; and

means for recording said address-added data signal at a sector having said first physical address when a defective sector is not detected, and at a sector having said second physical address when a defective sector is detected.

4,841,499

MULTI-DISC PLAYER

Akira Takahashi; Testuro Kamimura; Masahiko Kawamura; Kiyoshi Morikawa, and Sei Onishi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 160,049
Claims priority, application Japan, Feb. 24, 1987, 62-39295; Feb. 24, 1987, 62-39299
Int. Cl.[4] G11B *17/28, 5/48, 25/04*
U.S. Cl. 369—38 **11 Claims**

1. A disc selection device in a multi-disc player, comprising:

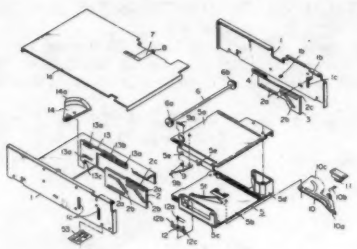
a magazine adapted to accommodate a plurality of discs therein;

a holder for receiving said magazine in a magazine inserting direction and for holding said magazine;

slide plates provided at both sides of said holder, said slide plates being formed with cam surfaces for moving said holder in a vertical direction which direction is perpendicular to the magazine inserting direction, said slide plates being also formed with racks;

left and right gears engageable with said racks for driving said slide plates; and

a shaft for connecting together said left and right gears to drive said slide plates in a same direction.



4,841,500

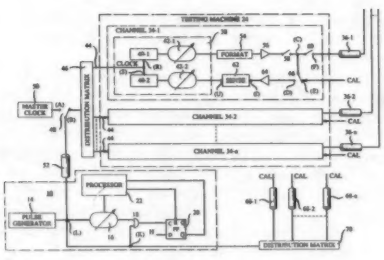
PRINTED CIRCUIT BOARD FABRICATION TECHNIQUE

Wha-Joon Lee, Lawrenceville, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Mar. 17, 1988, Ser. No. 169,543

Int. Cl.[4] G04F *8/00, 10/00*

U.S. Cl. 368—120 **5 Claims**



1. A method for fabricating a printed circuit board comprising the steps of:

soldering at least one lead of at least one component to a metallized area on an insulative substrate; and

testing the circuit board by launching at least one test signal from a testing machine to the circuit board along a circuit path and then analyzing, at the testing machine, each response signal generated by the circuit board and communicated to the testing machine along the circuit path in response to the test signal, each signal incurring a propagation delay over at least a portion of the circuit path traveled thereby, characterized in that:

the step of testing further includes the step of compensating the testing machine in accordance with the magnitude of the propagation delays incurred by each signal as it travels along at least a portion of a circuit path, the propagation delays being measured by the steps of:

(a) launching a first pulse into a first end of the circuit path so that the first pulse propagates to a node of interest along said path;

(b) simultaneously launching a second pulse into one end of a programmable delay line which serves to delay the second pulse from reaching a second end of the delay line by an adjustable time period;

(c) checking whether the second pulse has reached the second end of the delay line at substantially the same time the first pulse has reached said node of interest, and, if not, adjusting the delay of the programmable delay line by a predetermined amount; and

(d) repeating steps (a)–(c) until the second pulse reaches the second end of the delay line at about the same instant as the first pulse reaches said node of interest.

4,841,501

PLASTIC SUBSTRATE FOR OPTICAL DISK AND PROCESS FOR PRODUCING THE SAME

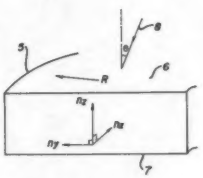
Akihiro Izuka, Himeji; Yoshio Onizawa, Hyogo, and Mitsuru Yamashita, Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,720

Claims priority, application Japan, Mar. 3, 1986, 61-45900

Int. Cl.[4] G11B *11/12, 7/26*

U.S. Cl. 369—13 **5 Claims**



1. A recording medium for optical high-density data storage and retrieval systems designed to record and/or read data on a recording layer supported on a flat transparent plastic substrate by means of an incident laser beam passing through the flat transparent plastic substrate, characterized in that the absolute values of the difference between the refractive index (n_z) in the direction perpendicular to the flat surfaces of the transparent plastic substrate and the refractive indexes (n_x) and (n_y) in the direction parallel to the flat surfaces thereof, that is, $|n_z-n_x|$ and $|n_z-n_y|$ are smaller than 4×10^{-4}.

4,841,502

INFORMATION RECORDING SYSTEM AND REPRODUCING FOR RECORDING AND REPRODUCING INFORMATION ON A MAGNETO-OPTICAL DISK

Teruo Murakami, Yokohama, and Naobumi Seo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1986, Ser. No. 871,558

Claims priority, application Japan, Jun. 14, 1985, 60-128265; Sep. 17, 1985, 60-203325; Oct. 7, 1985, 60-221771

Int. Cl.[4] G11B *13/04, 11/12*

U.S. Cl. 369—13 **6 Claims**

1. An information recording and reproducing system for recording and reproducing information on a magneto-optical disk, comprising:

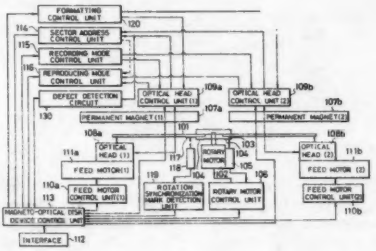
a magneto-optical disk having a number of sectors each having at least one address portion and information recording portion;

a disk driving means for driving the magneto-optical disk placed on a turntable;

a first optical system having a first magnet means, a first optical head, and a first optical head control means for carrying out an erasing operation on the disk prior to a recording of information on the disk and for carrying out a sector address reproducing operation on the disk; and

a second optical system having a second magnet means, a second optical head, and a second optical head control means for carrying out an information recording operation on the disk and a sector address reproducing operation on the disk,

said first and second optical heads being arranged and controlled such that when the first optical head is positioned at an address portion of one sector, the second optical head is positioned at an information recording portion of



another sector, wherein when the first optical head is reproducing the sector address of the address portion, the second optical head is recording information to the information recording portion, and when the second optical head is positioned at an address portion of one sector, the first optical head is positioned at an information recording portion of another sector, wherein when the second optical head is reproducing a sector address of the address portion, the first optical head is erasing information from the information recording portion.

4,841,503

SYSTEM FOR RECORDING INFORMATION FROM ONE RECORDING MEDIUM ONTO A REVERSING CASSETTE TAPE RECORDING MEDIUM WITHOUT LOSS OF INFORMATION DURING A REVERSING OPERATION

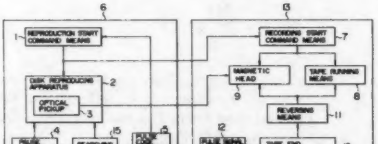
Jiro Yamada, Neyagawa; Masahide Haseoka, Kadoma, and Isao Obata, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 12, 1987, Ser. No. 84,460

Claims priority, application Japan, Aug. 18, 1986, 61-192353

Int. Cl.[4] G11B *5/86, 13/04*

U.S. Cl. 369—14 **3 Claims**



1. An information reproducing and recording system comprising:

a disk reproducing apparatus for reproducing information from a plurality of information sections on a disk;

a recording apparatus for recording the information reproduced by the disk reproducing apparatus onto a recording medium, said recording medium having an end;

operation start command means for starting the operations of the disk reproducing apparatus and recording apparatus synchronously with each other;

detecting means for detecting that the recording medium of said recording apparatus has reached said end;

searching means, responsive to the detecting output of said detecting means, for interrupting the reproducing operation of said disk reproducing apparatus and searching for a header signal of an information section, the reproduction of which has been interrupted;

pause command means for temporarily stopping said disk reproducing apparatus in response to the completion of the header signal search of said searching means;

reversing means for receiving the output of said detecting means and reversing the driving direction of the recording medium; and,

means for releasing the temporary stop state of said reproducing apparatus after the reversing means reverses the driving direction of the recording medium.

4,841,504

METHOD AND APPARATUS FOR RECORDING AN INFORMATION SIGNAL ON A ROTARY RECORDING MEDIUM

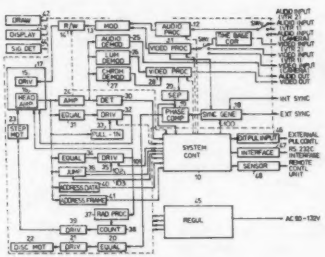
Hirohisa Yamaguchi, Tokyo, and Akira Mashimo, Tokorozawa, both of Japan, assignors to Teac Corporation, Tokyo, Japan

Filed Jul. 14, 1987, Ser. No. 73,979

Claims priority, application Japan, Jul. 16, 1986, 61-167547

Int. Cl.[4] G11B *17/22*

U.S. Cl. 369—32 **9 Claims**



1. A method of recording an information signal on a rotary recording medium having a track comprising an unrecorded track not recorded with information signals and a pre-recorded track recorded with information signals and continuing to the unrecorded track by recording and reproducing means being selectively operated in a recording mode and a reproducing mode for recording information signals on and from the rotary recording medium in such a manner that an information signal is recorded on an unrecorded track turn which is a portion of the unrecorded track scanned by the recording and reproducing means during one revolution of the rotary recording medium continuously from a pre-recorded information signal recorded on a pre-recorded track turn, the pre-recorded track turn being a portion of the pre-recorded track scanned by the recording and reproducing means during one revolution of the rotary recording medium, the method comprising the steps of:

searching a pre-recorded track turn immediately preceding the unrecorded track by feeding the recording and reproducing means operated in the reproducing mode across the track responsive to a first command signal commanding a preparation mode for the recording;

repeatedly reproducing the information signal recorded on the searched pre-recorded track turn by moving the recording and reproducing means back to the beginning of the track turn by one track pitch at an end of the track turn;

scanning an unrecorded track turn immediately following the pre-recorded track turn by the recording and repro-

ducing means continuously from the pre-recorded track turn to the unrecorded track turn responsive to a second command signal commanding a start of the recording by prohibiting the movement of the recording and reproducing means moving back to the beginning of the searched pre-recorded track turn; and

switching the recording and reproducing means from the reproducing mode to the recording mode at a recording start location on the unrecorded track to cause the recording of the information signal.

4,841,505

PICKUP POSITION CONTROL METHOD ENABLING RESTART OF REPRODUCTION AFTER INTERRUPTION

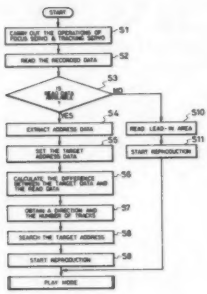
Yoshio Aoyagi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 26,314, Mar. 16, 1987, abandoned. This application Oct. 28, 1988, Ser. No. 268,671

Claims priority, application Japan, Mar. 14, 1986, 61-57277

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—32 **5 Claims**



1. A pickup position control method for a disk reproducing device, comprising the steps of when the power supply is interrupted during reproduction:

holding a pickup for reading data recorded on a disk-shaped recording medium at the last reading position of said recording medium;

reading by said pickup data recorded on said disk-shaped recording medium on said last reading position when said power supply is resupplied to said disk reproducing device;

generating target address data according to read address data in said read recorded data, said target address data having a predetermined, non-identical relationship to said read address data;

moving said pickup according to an address difference between said target address data and said read address data to a position indicated by said target address data; and

beginning reproduction from said position indicated by said target address data.

4,841,506

RANDOM PLAYING METHOD FOR DISK PLAYER

Kazuhiro Kiyoura; Fumio Endo; Toshiyuki Kimura; Yoshio Aoyagi, and Kazunari Nakamura, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,314

Claims priority, application Japan, Jan. 1, 1986, 61-233727; Oct. 1, 1986, 61-233724; Oct. 1, 1986, 61-233725; Oct. 1, 1986, 61-233726; Oct. 1, 1986, 61-233723; Oct. 1, 1986, 61-233728

Int. Cl.[4] G11B *17/06, 17/22, 27/19*

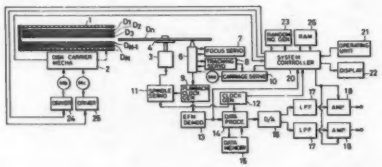
U.S. Cl. 369—32 **6 Claims**

1. A random playback method for a disk player, the disk player playing a disk having a plurality of information sections recorded thereon, and each information section being assigned a different number, the method comprising the steps of:

storing information which represents the last information section played back by the disk player;

determining the number of information sections recorded on the disk;

comparing the determined number of recorded information sections with a predetermined number of information sections;



randomly generating a number which corresponds to one of the numbers assigned to the information sections;

repeating said step of randomly generating a number only if the generated random number corresponds to the number assigned to the information section which was last played back by the disk player, and the determined number of recorded information sections is greater than the predetermined number of information sections; and

playing back the information section corresponding to the finally generated random number.

4,841,507

OPTICAL HEAD FOR AN OPTICAL RECORDING AND REPRODUCING APPARATUS

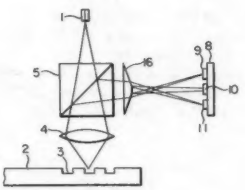
Hitoshi Imai; Ryuichiro Arai; Kimiyuki Koyanagi, and Michihiro Tadokoro, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 1, 1987, Ser. No. 127,049

Claims priority, application Japan, Dec. 5, 1986, 61-186833

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **17 Claims**



1. An optical head for an optical recording and reproducing system including an information carrier having a recording surface and a guide groove formed in the recording surface, said optical head comprising:

a light source adapted to generate a first light beam;

a first optical means for focusing said first light beam along a first light path and into the guide groove;

a second optical means for reflecting a reflected light beam, initially reflected from the guide groove along the first light path, away from the first light path and along a second light path;

an optical element disposed in the second light path and having a face including a cylindrical surface formed on a central portion of said face and slanted surfaces formed on said face on both sides of said central cylindrical surface, said optical element being adapted to divide the reflected light beam into three light beams; and

a light receiving element having at least three light receiving

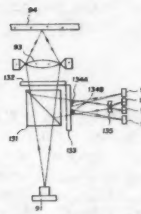
units receiving the respective light beams divided by said optical element.

4,841,508

METHOD AND APPARATUS FOR DETECTING A TRACK AND FOCUS ERRORS IN AN OPTICAL HEAD

Yasuo Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,484
Claims priority, application Japan, Dec. 25, 1986, 61-310311; Mar. 20, 1987, 62-66178; Apr. 8, 1987, 62-87658
Int. Cl.[4] G11B 7/125
U.S. Cl. 361—45 **8 Claims**



1. A method for detecting a track and fucus errors in an optical head comprising steps of,

radiating light beam to be directed to a recording medium, and

detecting light amount of light beam which is reflected through an object lens from said recording medium

wherein said light beam which is reflected is divided in its cross section into light beams of at least a first, second and third regions,

said first region being expressed in its cross sectional position by the equations,

$$\left.\begin{aligned}\left(X-\delta\cdot\frac{d}{F}\right)^2+Y^2 &\leqq \left(\frac{d}{2}\right)^2\\ \left(X+\delta\cdot\frac{d}{F}+\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2 &\leqq \left(\frac{d}{2}\right)^2\end{aligned}\right\}$$

said second region being expressed in its cross sectional position by the equations, and

$$\left.\begin{aligned}\left(X+\delta\cdot\frac{d}{F}\right)^2+Y^2 &\leqq \left(\frac{d}{2}\right)^2\\ \left(X-\delta\cdot\frac{d}{F}-\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2 &\leqq \left(\frac{d}{2}\right)^2\end{aligned}\right\}$$

said third region being excluded from said first and second regions and expressed in its cross sectional position by the equations,

$$\left.\begin{aligned}\left(X+\delta\cdot\frac{d}{F}-\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2 &\geqq \left(\frac{d}{2}\right)^2\\ \left(X-\delta\cdot\frac{d}{F}+\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2 &\geqq \left(\frac{d}{2}\right)^2\end{aligned}\right\}$$

where P is a pitch of pits or pregrooves of said recording medium, λ is a wavelength of said light beam, δ is a value which is from equal to or more than zero to equal to or less than a maximum moving distance of said object lens in a direction of a track error, d is a diameter of said light beam which is reflected, X is an axis which is parallel to a track error direction to intersect the light axis of said light beam which is reflected and Y is an axis which is orthogonal to said X to intersect said light axis, and

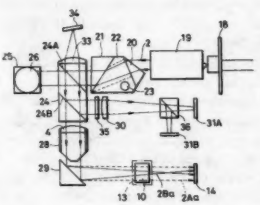
a track error being detected in accordance with said light beams of said first and second regions, and a focus error being detected in accordance with said light beam of said region.

4,841,509

APPARATUS AND METHOD FOR DETECTING FOCUS ERROR SIGNAL AND TRACKING ERROR SIGNAL IN AN OPTICAL DISK SYSTEM

Toshimasa Kamisada, Hiratuka, and Akira Saito, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1986, Ser. No. 937,365
Claims priority, application Japan, Dec. 4, 1985, 271450/1985
Int. Cl.[4] G11B 7/13
U.S. Cl. 369—46 **3 Claims**



1. A system for detecting a signal representative of a focus error and tracking error by an optical disk reader comprising:

means for irradiating the disk to obtain reflected zero and first order diffraction rays;

a cylindrical lens for selectively converging the rays to an elliptical image having a major axis defined by nonconverged rays and a minor axis defined by converged rays, the image including first and second interference portions of the diffraction rays defined by the interference of the first order diffraction rays with the zero order diffraction rays;

a beam splitter disposed to split the rays into first and second photoreceptive images;

first and second photodetectors selectively spaced forward and behind a convergent point for reception of a converging image at the first photodetector and an expanding image at the second photodetector, and each having at least four photoreceptive portion, a selective two of the four being aligned with the major axis for detecting tracking errors and a selective other two being aligned with the minor axis for detecting focus error from reception of the photoreceptive images each photoreceptive portion being capable of producing an output representative of received image intensity; and,

said selected major axis photoreceptive portions being dis-

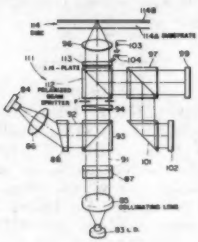
posed to identify a tracking error represented by a sum of the differences between outputs from the major axis photoreceptive portions of each photodetector and said minor axis photoreceptive portions being disposed to identify a focus error represented by a difference of the sums between outputs from the minor axis photoreceptive portions of each photodetector.

4,841,510

OPTICAL CHARACTERISTIC MEASURING APPARATUS FOR AN OPTICAL RECORDING MEDIUM SUBSTRATE

Akihiko Yoshizawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,775
Claims priority, application Japan, Apr. 10, 1986, 61-82810
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—46 **10 Claims**



1. An optical characteristic measuring apparatus for measuring a carrier to noise ratio of an optical recording medium substrate comprising:

a linear polarized light producing means for producing a linear polarized parallel light beam;

a condenser lens system receiving said linear polarized parallel light beam, condensing said linear polarized parallel light beam and projecting a condensed light toward said optical recording medium substrate;

an analyzer arranged on one side of said optical recording medium substrate, said analyzer being in a crossed Nicol state for transmitting only a polarized light component, said polarized light component being polarized in an orthogonal direction to said linear polarized parallel light beam from said linear polarized light producing means; and

a light receiving means for receiving the polarized light component transmitted by said analyzer wherein a carrier to noise ratio of said optical recording medium substrate can be evaluated by determining an amount of polarized light component received by said light receiving means.

4,841,511

CONSTANT LINEAR VELOCITY DISK ROTATING APPARATUS

Motoyuki Suzuki; Yoshio Miura, and Akio Fukushima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,315
Claims priority, application Japan, Oct. 17, 1986, 61-245348
Int. Cl.[4] G11B *19/24*
U.S. Cl. 369—50 **9 Claims**

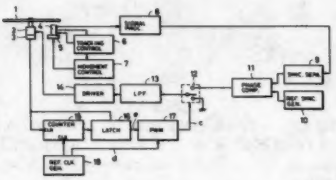
1. A constant linear velocity disk rotating apparatus for rotating a disk at a constant linear velocity, comprising:

signal detecting means which detects a signal provided by a disk in which data is recorded at a constant linear velocity at different radial positions relative to the disk;

phase comparing means which compares the phase of the detection signal of said signal detecting means with that of a reference signal, and provides a control signal on the basis of the result of comparison;

driving means which drives the disk for rotation according to the control signal;

disk rotation detecting means which detects the rotating frequency or period of the disk; and



gain regulating means which regulates the gain of the control signal according to the output of said disk rotation detecting means in inverse proportion to the radial position r of said signal detecting means relative to the disk;

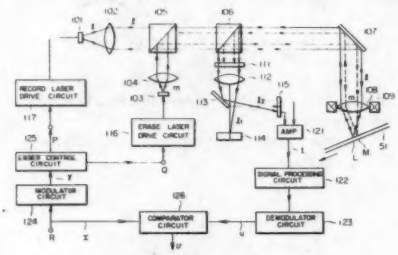
wherein the control signal provided by said phase comparing means is supplied to said driving means after the gain of the control signal is regulated by said gain regulating means.

4,841,512

OPTICAL DISK APPARATUS WITH AN ERASE CHECKING FUNCTION

Shinji Kubota; Kazutoyo Hirosawa, both of Hirakata, and Tomio Yoshida, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1986, Ser. No. 942,790
Claims priority, application Japan, May 16, 1986, 61-112902
Int. Cl.[4] G11B *27/36*
U.S. Cl. 369—54 **8 Claims**



1. An optical disk apparatus with an erase checking function comprising:

recording means for recording data in a selected area of an optical disk by means of a very small spot produced from a light source;

reproducing means for reproducing the data recorded by said recording means;

erasing means for erasing data recorded by said recording means;

erase checking means, operative during a test mode, for checking that said erasing means is correctly operating, said erase checking means causing said erasing means to erase first data recorded in a first test region of said optical disk, thereafter causing said recording means to record second data in said first test region where the first data has been erased, and determining if the second data thus recorded is correctly reproduced by said reproducing means; and

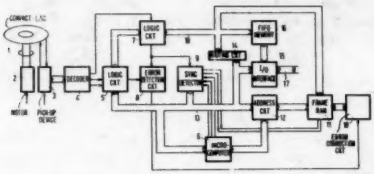
power change means for changing the power level of said

erasing means from a predetermined normal level when said erasing means erases said first data.

4,841,513
SEQUENTIAL BUFFER DEVICE

Hassan Farhangi, and Johan W. M. E. Konings, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1987, Ser. No. 57,883
Claims priority, application Netherlands, Jun. 4, 1986, 8601437
Int. Cl.[4] G11B 5/02
U.S. Cl. 369—59 **7 Claims**



1. A sequential buffer device for connection to a player for an optically readable memory disc, which player includes error protection members for data originating from the disc was well as reconfiguration members for presenting data elements of successive data frames on a serial output at a predetermined, uniform speed, which sequential buffer deivce comprises: a serial input coupled to said serial output of said player to receive successive data frames which contain user data and possibly error detection data and error correction data in a predetermined pattern (format); a random access memory (RAM) connected to said serial input for storing the data of at least one frame received in a first byte-wise write operation under the control of a byte-wise incrementable address counter; a cylically operative error detection device also connected to said serial input to perform error detection on the basis of the error detection data in a received frame; an error correction device bidirectionally connected to the random access memory to localize and correct an error under the control of the error detection device and on the basis of the error correction data in the frame; and a first-in-first-out memory having a capacity most equal to the capacity of the random access memory and having a data input which is connected to a data output of the random access memory for executing a first read and a second write operation in synchronism with said first write operation in order to write data from the random access memory into the first-in-first-out memory, said first-in-first-out memory also having a data output for executing a user read operation asynchronously with respect to said first write operation in order to read-out data from said first-in-first-out memory.

4,841,514
OPTICAL RECORDING METHOD AND APPARATUS USING TWO FIGHT SPOTS

Nobuyoshi Tsuboi, Ibaraki; Atsumi Watanabe, Hitachi; Yoshio Sato, Hitachi; Satoshi Shimada, Hitachi, and Hiroshi Sasaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,421
Claims priority, application Japan, Oct. 16, 1985, 60-228775
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—100 **13 Claims**

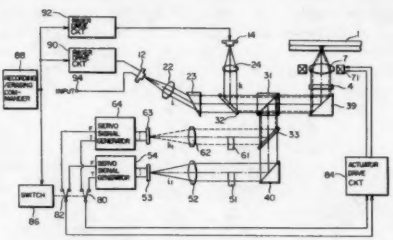
1. An optical recording apparatus comprising:

an optical recording medium in which a portion thereof irradiated by a light spot to be heated to a temperature exceeding a first temperature higher than room temperature develops a first phase structure when the heated portion is cooled down thereafter and the portion irradiated by a light spot to be heated to a temperature between the first temperature and a second temperature exceeding the room temperature and not exceeding the first temperature develops a second phase structure when the heated portion is cooled down thereafter, whereby information is recorded by corresponding one of the first and second phase structures to a state that information has been recorded and by corresponding the other one thereof to a state that information has been erased;

optical means for focusing two light beams to form two light spots having different degrees of focus and for positioning the two light spots on said optical recording medium and along a recording track thereof to be radiated as a preceding spot and a succeeding spot located in the vicinity of the preceding spot;

information means for providing information for recording on said optical recording medium;

first adjust means for adjusting said optical means so that the degree of focus of the preceding spot is set to a level



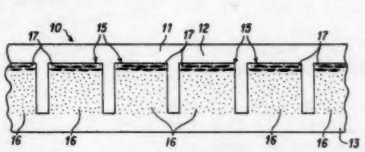
to preheat a portion of said optical recording medium irradiated with the preceding spot to a temperature not exceeding the first temperature and the degree of focus of the succeeding spot is set to a level to be higher than the degree of focus of the preceding spot to heat the preheated portion to a temperature exceeding the first temperature such that when said preheated portion is irradiated with said succeeding spot in accordance with said information from said information means, said information is recorded by setting said preheated portion to said first phase structure; and

second adjust means for adjusting said optical means so that the degree of focus of the preceding spot is set to a level to heat the portion of the optical recording medium to a temperature between the first temperature and the second temperature and the degree of focus of the succeeding spot is set to a level lower than the degree of focus of the preceding spot to hold the heated portion to a temperature between the first temperature and the second temperature so as to enable erasing of said optical recording medium.

4,841,515
READ-WRITE OPTICAL DISK

Wesley James, Brooklyn, N.Y., assignor to Micronic Interface Technologies, New York, N.Y.

Filed Jul. 1, 1987, Ser. No. 68,923
Int. Cl.[4] G11B 7/24
U.S. Cl. 369—100 **19 Claims**



1. An optical disk, readable by a laser reading device, capable of undergoing multiple write cycles and comprising a

substrate member for first and second materials, having specific optical reflectivities substantially differing from each other, with said disk further comprising means for permitting a selective exposure, to the laser of said reading device, of either of said first or second materials at selected locations on said disk.

4,841,516

TURNTABLE FOR MOUNTING RECORDING MEDIUM IN DISK FORM

Michio Ohmori; Michiya Okamura, and Hiroshi Yui, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

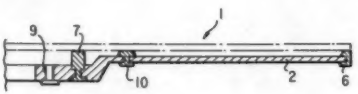
Filed Sep. 15, 1987, Ser. No. 96,484

Claims priority, application Japan, Sep. 20, 1986, 61-223255; Sep. 25, 1986, 61-226516

Int. Cl.[4] G11B *3/60*

U.S. Cl. 369—264 **11 Claims**

1. A turntable for mounting a recording medium in a disk form which comprises a substrate in a disk form and a receiving portion projecting from the top of said substrate, said substrate and said receiving portion being formed by injection-molding, said substrate being shaped from a thermoplastic composite resin, said resin comprising (a) a non-crystalline thermoplastic resin having a glass transition point of at least 100° C. and (b) reinforcing fibers in said thermoplastic resin in an amount from 19 to 70 vol. % relative to the sum of said resin and said fibers, wherein said resin has a dynamic shear modu-



lus, G', of at least 1.5×10^{10} dyne/cm^2 as measured at a frequency of 11 Hz over the temperature range of −40° C. to 100° C., the ratio of dynamic shear modulus at −40° C., G_1' to dynamic shear modulus at 100° C., G_2' of up to 1.5, and a density of up to 2.0 g/cm^3, and said receiving portion being shaped from a thermoplastic elastomer having a hardness of 5 to 40.

4,841,517

DISK CLAMPING DEVICE

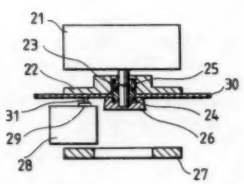
Toshihiko Kurihara, and Tadashi Funabashi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,824

Claims priority, application Japan, Apr. 16, 1987, 62-92031

Int. Cl.[4] G11B *25/04*

U.S. Cl. 369—270 **7 Claims**



1. A disk clamping device, comprising:

a turntable mounted fixedly on a disk drive shaft of a motor;

a first hub for centering a disk having a small diameter hole, said first hub being mounted on said disk drive shaft;

a second hub for centering a disk having a large diameter hole, said second hub being separated from said first hub and movably mounted to engage said disk drive shaft and having a clamping surface which is brought into contact with a surface of said disk having a small diameter hole when engaged with said disk drive shaft; and

a separate clamper movably mounted so as to be brought into contact with a surface of said disk having said large diameter hole, wherein when said clamping surface of said second hub is brought into contact with said surface of said disk having a small diameter hole, said clamper is positioned away from said surface of said disk having a small diameter hole.

4,841,518

CLAMPING MECHANISM FOR INFORMATION RECORDING DISK

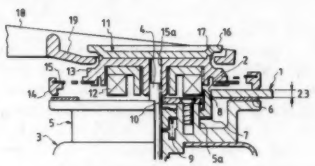
Shinsaku Nozu; Masao Kase, and Masakazu Yamashita, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,831

Claims priority, application Japan, Aug. 27, 1987, 62-130799[U]

Int. Cl.[4] G11B *17/04*

U.S. Cl. 369—270 **5 Claims**



1. In a clamp mechanism for clamping an information recording disk having a clamper arranged to press and clamp an information recording disk against a turntable using a magnetic attractive force, the improvement wherein said clamper comprises: a retaining member vertically movable is attracted to said turntable by said magnetic attractive force, a ring-like pressing member having a diameter larger than that of said retaining member arranged to abut said information recording disk, and a plate spring member interconnecting said retaining member in such a manner that said retaining member and said pressing member are vertically movable relative to each other.

4,841,519

APPARATUS FOR DISCRIMINATING AN OPTICAL SIGNAL FROM OTHERS AND AN APPARATUS FOR TUNING AN OPTICAL WAVELENGTH FILTER USED IN THE SAME

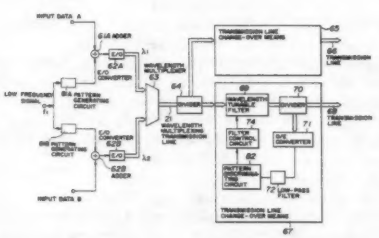
Makoto Nishio, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,384

Claims priority, application Japan, Jun. 26, 1987, 62-160624; Jan. 6, 1988, 63-1474

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—3 **6 Claims**



1. An apparatus for discriminating an optical signal from others comprising,

a plurality of adding means, each including an adder in which input data and a discriminating signal of a frequency lower than a signal band of said input data are added to produce an added signal,

a plurality of electric-optic converters, each converting one of said added signals into an optical signal of a predetermined wavelength different from others,

a wavelength multiplexer for multiplexing optical signals supplied from said plurality of electric-optic converters to produce an optical wavelengh division multiplexing signal which is propagated through a wavelength multiplexing transmission line,

a divider for dividing said optical wavelength division multiplexing signal into a plurality of optical wavelength division multiplexing signals, and

a plurality of transmission line change-over means, each supplying an optical signal of a predetermined wavelength to a corresponding transmission line and including a wavelength filter coupled to said divider for passing a optical signal of a wavelength selected from plural wavelengths therethrough, a circuit for detecting a discriminating signal included in said optical signal passed through said wavelength filter, and a circuit for controlling said wavelength filter in accordance with said discriminating signal detected in said circuit for detecting whereby a center wavelength of said wavelength filter is tuned to a predetermined tuning wavelength.

4,841,520

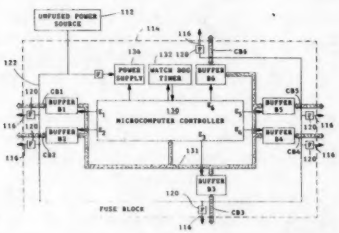
DATA TRANSMISSION SYSTEM WITH BUS FAILURE DETECTION SYSTEM

Lee W. Steely, Reinholds, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 921,185, Oct. 21, 1986. This application Dec. 8, 1987, Ser. No. 130,247

Int. Cl.[4] H04J *3/14*

U.S. Cl. 370—13 **10 Claims**



1. In a multiplex system of the type comprising bus means; a central controller coupled to the bus means and comprising means for applying clock signals to the bus means, means for receiving data signals from the bus means, and means for applying data signals to the bus means; and a first remote station coupled to the bus means and comprising first means for maintaining a count of the clock signals and means for applying a first data signal to the bus means during a time period corresponding to a first selected count; and a second remote station coupled to the bus means and comprising second means for maintaining a count of the clock signals and means for receiving a second data signal from the bus means during a time period corresponding to a second selected count, the improvement comprising:

third means for detecting a failure of the bus means; and

fourth means, responsive to the third means, for preventing the clock signal from being carried at least to the second remote station during a detected failure of the bus means.

4,841,521

METHOD AND SYSTEM FOR BIDIRECTIONALLY TRANSMITTING DATA

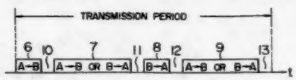
Eiichi Amada, Kodaira; Hirotoshi Shirasu, Yokohama, both of Japan; Hiroshi Takatori, Ottawa, Canada; Tohru Kazawa, Kokubunji, Japan; Toshiro Suzuki, Tama, Japan; Takanori Miyamoto, Fuchu, Japan, and Tatsuya Kameyama, Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,036

Claims priority, application Japan, May 28, 1986, 61-121009; Feb. 9, 1987, 62-26243

Int. Cl.[4] H04B *3/20, 1/56;* **H04L** *5/16*

U.S. Cl. 370—31 **14 Claims**



1. A method for bidirectionally transmitting data between two terminal stations through a transmission line by switching in time the direction of data transmission, comprising the steps of:

configuring a transmission signal frame with a first time section having a fixed transmission direction and a second time section having a variable transmission direction, wherein information data and transmission direction control data are transmitted during said first time section from one of the terminal stations to the other of the terminal stations;

detecting the transmission direction control data in said other of the terminal stations; and

determining the transmission direction for said second time section on the basis of the detected transmission direction control data.

4,841,522

TIME DIVISION CHANNEL SWITCHING CIRCUIT

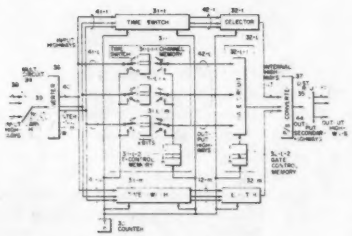
Katsuyuki Yamazaki, Tanashi, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,820

Claims priority, application Japan, Mar. 13, 1987, 62-56706

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—64 **3 Claims**



1. In a time division channel switching circuit, in which a desired sub channel accommodated in a desired channel on an inputhighway, where n (an integer more than one) channels, each having m (an integer more than one) sub channels, have been time-division-multiplexed, is switched to a sub channel of a desired channel on a time-division-multiplexed output highway, the improvement comprising:

a serial-to-parallel converter whereby the input highway is converted into a plurality m of internal highways equal in number to paralleled sub channels;

time switches of the same number m as that of sub channels, each time switch having channel memories of the same

number as that of sub channels and each channel memory having a memory capacity separated into a plurality of blocks equal to the number n of channels;

selectors, each provided in correspondence to one of the time switches, for selecting a desired channel memory output of the corresponding time switch; and

a parallel-to-serial converter for time division multiplexing the output of each selector into the output highway;

wherein the internal highways are supplied to all the time switches in parallel; the contents of the desired same address are read out of the respective channel memories in one of the time switches and a desired one of the channel memory outputs is selected by one of the selectors in correspondence to said one of the time switches.

4,841,523

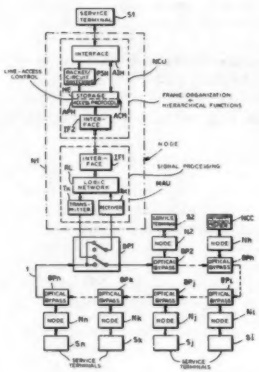
METHOD OF ACCESSING LOCAL AREA NETWORKS WITH A UNIDIRECTIONAL RING-TRANSMISSION LINE, AND LOCAL AREA NETWORK USING THIS METHOD

Daniele Roffinella, Moncalieri, and Maurizio Sposini, Turin, both of Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 23, 1987, Ser. No. 137,801

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—89 **24 Claims**



1. A method of asynchronously accessing a high-speed local area network having a ring-transmission line along which a plurality of nodes are arranged with each node being capable of signal regeneration, said method comprising the steps of:

organizing information which is transmitted along said line into hybrid frames each having a circuit region in the form of a zone allotted to communications with information-continuity requirements and a packet region in the form of a zone allotted to communications which do not require continuity of information;

effecting asynchronous access of the individual nodes for circuit and packet transmission along said line in sequence to said line in a given order and maintaining said order in both the circuit region and the packet region of each of said frames; and

in the packet region of each frame, starting from an instant preceding by a predetermined time period the end of the frame, disabling the packet transmission of the node which has the right of transmission at that instant or of the nodes which would have the right of access from that instant to the end of the present frame, thereby avoiding overlapping between adjacent frames.

4,841,524

DIGITAL DATA MULTIPLE CONVERSION SYSTEM FOR CONVERTING DATA HAVING A FREQUENCY TO DATA HAVING ANOTHER FREQUENCY BY A DIGITAL STUFFING METHOD

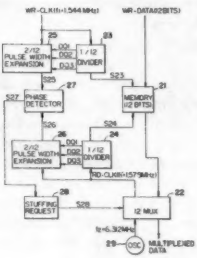
Hirohisa Miyaou, Yokohama; Takahiro Furukawa, Oyama, and Toru Kosugi, Omiya, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 16, 1988, Ser. No. 169,217

Claims priority, application Japan, Mar. 16, 1987, 62-060424

Int. Cl.[4] H04J *3/04*

U.S. Cl. 370—112 **6 Claims**



1. A digital data multiplexing-demultiplexing system comprising:

a memory unit receiving and storing input data having a bit length of N, N being an integer;

a first frequency divider receiving an input clock having a first frequency and frequency-dividing the input clock by N to output a first frequency-divided signal;

a first pulse width expansion circuit connected to receive a plurality of frequency divided pulses which comprise at least start and end frequency divided pulses in a first predetermined frequency division period from the first frequency divider, receiving the input clock, and outputting a first pulse width expanded signal of the input clock, a pulse width thereof corresponding to a number of lost pulses of the input clock pulse plus one;

a circuit outputting a read clock having a second frequency near to the first frequency and stuffing the read clock;

a second frequency divider receiving the read clock and frequency-dividing the read clock by N to output a second frequency-divided signal;

a second pulse width expansion circuit connected to receive a plurality of frequency divided pulses which comprise at least start and end frequency divided pulses in a second predetermined frequency division period from the second frequency divider, receiving the read clock, and outputting a second pulse width expanded signal of the read clock, a pulse having a width corresponding to a number of lost pulses of the read clock pulses plus one;

a phase detector receiving the first and second pulse width expanded signals, and outputting a phase detection signal when phases of both pulse width expanded signals coincide; and

a stuffing request circuit receiving the phase detection signal, and outputting a stuffing request signal to the stuffing circuit,

the memory unit storing the input data in response to the first frequency-divided signal, and outputting the stored data to the stuffing circuit in response to the second frequency-divided signal, and

the stuffing circuit stuffing the read clock in response to the stuffing request signal.

4,841,525

METHOD AND ARRANGEMENT FOR TESTING MEGA-BIT MEMORY MODULES WITH ARBITRARY TEST PATTERNS IN A MULTI-BIT TEST MODE

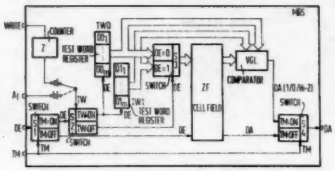
Normen Lieske, Augsburg, and Werner Seichter, Unterföhring, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,155

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634352

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—21 **6 Claims**



1. A method for testing mega-bit memory modules in a multi-bit test mode with arbitrary test patterns, whereby at reading in a 1-bit datum the 1-bit datum is simultaneously mapped onto a cell group of m cells of the memory cell field described by the m-dimensional function

$$f(DE)=\{DE\}_{1,\ldots,m} \text{ with } DE\epsilon\{0,1\}$$

and whereby at reading out the cell contents of such a cell group the cell group is inversely mapped by the m-dimensional inverse function

$$f^{-1}(\{DA\}_{1,\ldots,m})=DA \text{ with } DA\epsilon\{0,1\}$$

to get the original datum,

reading in m data information (DE) bits individually into the mega-bit memory module (MBS) and combining such bits into an m-dimensional test word (TW0) in a test word register,

allocating the bit places of a test word (TW0) to the cells of an m-dimensional cell group, and

subsequently mapping the test word (TW0) or the negated test word (TW0) onto a cell group or onto a plurality of cell groups of the cell field (ZF).

4,841,526

DATA COMMUNICATIONS SYSTEM

Jon C. Wilson, 200 N. Maryland Ave., #301, Glendale, Calif. 91206-4236; David A. Shick, 27366 Compostela, Mission Viejo, Calif. 92692; Robert L. Haynie, 16181 Jasmine Way, Los Gatos, Calif. 95030; Donald R. Wilder, 525 Gabilan St. #8, Los Altos, Calif. 94022; Larry D. Zimmerman, 4504 Poinsettia, San Jose, Calif. 95136; Richard M. LeCour, 225 Massol Ave., Los Gatos, Calif. 95030, and D. James Guzy, 1340 Arbor Rd., Menlo Park, Calif. 94025

Continuation-in-part of Ser. No. 614,283, May 25, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 932,926

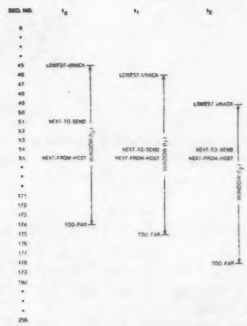
Int. Cl.[4] G08C *25/02*

U.S. Cl. 371—32 **10 Claims**

1. A communication system comprising a first and a second station wherein data frames are transmitted from the first station to the second station through a first communication link, each data frame including data and an identification number, said data frames having a selected frame size, said identification numbers of the frames being in the sequential order of transmission to facilitate frame identification, said first station storing the data frames transmitted by the first station and said second station storing the data frames received by the second station, said second station transmitting through the first or a second communication link data groups including acknowledgement information relating to the identification members of data frames successfully received by the second station;

said first station storing the data frames in such manner that the identification numbers of the frames are within a variable range of identification numbers defining a first window having an upper and lower limit wherein the first station evaluates the acknowledgement information received from the second station to vary the upper and lower limits of the first window; and

said second station storing the data frames in such manner that the identification numbers of the frames are within a variable range defining a second window having an upper



and lower limit for a variable range of identification numbers of possible data frames from the first station acceptable to the second station, wherein said second station evaluates the data frames received from the first station to vary the upper and lower limits of the second window, the difference between the upper and lower limits of each window defining its size;

wherein at least one of the two stations is such that the size of the first or the second window is selectable according to the speed, length or error rate of the first or the first and second communication links or the frame size used in connection therewith to increase the efficiency in communication link utilization.

4,841,527

STABILIZATION OF RANDOM ACCESS PACKET CDMA NETWORKS

Dipankar Raychaudhuri, Kendall Park, and Kuriacose Joseph, Plainsboro, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 16, 1987, Ser. No. 121,423

Int. Cl.[4] G08C *25/02*; G06F *11/14*

U.S. Cl. 371—32 **6 Claims**

1. A method for transmitting information in a CDMA system, said method comprising:

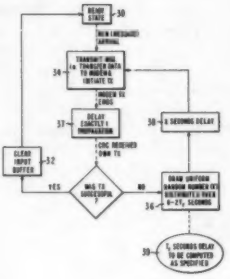
initially transmitting information in a code division multiple access channel;

determining if said information has been correctly received;

retransmitting said information with a selected time delay if said information has not been correctly received; and

repeating said determining and retransmitting steps until said information is correctly received using different time

delays, said different time delays being random in duration, but together having an average duration selected in



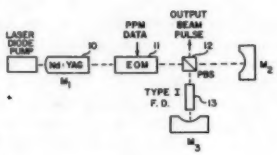
accordance with the occupancy of said channel to provide a single stability mode.

4,841,528

FREQUENCY DOUBLED, CAVITY DUMPED FEEDBACK LASER

Donald L. Sipes, Jr., Lisle, Ill., and Deborah L. Robinson, La Canada, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 6, 1988, Ser. No. 240,205
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—22 **10 Claims**



1. Apparatus for efficient frequency doubling while cavity dumping a pumped laser in a resonator cavity in order to produce modulated output light pulses comprising

a laser having a pumped gain medium in said resonator cavity for emitting light at a first frequency on a fixed axis between two mirrors,

modulating means placed between one of said two mirrors and said gain medium for deflecting light in said resonant cavity along a path at a fixed angle with respect to said fixed axis between said two mirrors in response to a cavity-dumping control signal,

a third mirror placed to receive resonant cavity light deflected by said modulating means, and to redirect it back on the same path,

frequency doubling means placed in said deflected light path between said modulating means and said third mirror, and

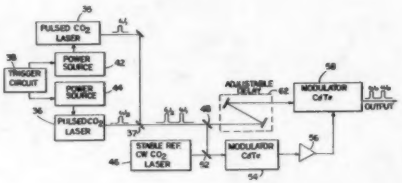
beamsplitting means placed between said frequency doubling means and said modulating means for separating out frequency doubled light as a modulated output pulse, and passing undoubled frequency light through said modulating means and said gain medium, whereby light in said resonator cavity between said two mirrors experiences cavity dumping and frequency doubling while transmitting a modulated pulse of light reflected from said third mirror and redirection of undoubled frequency light into said resonator cavity while transmitting said modulated pulse of light for greater efficiency.

4,841,529

SYSTEM FOR GENERATING A STABLE OPTICAL FREQUENCY

Ali Javan, Cambridge, Mass., assignor to Laser Science, Inc., Cambridge, Mass.

Division of Ser. No. 915,652, Oct. 6, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 94,423
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—32 **8 Claims**



1. In a system for generating stable optical pulses, the combination comprising

a first pulsed laser for generating a laser pulse subject to frequency variations,

a second pulsed laser for generating a laser pulse subject to frequency variations,

circuitry for causing the laser pulse generated by said second pulsed laser to occur a predetermined delay interval after the laser pulse generated by said first pulsed laser occurs,

a stable CW laser for producing a frequency stable reference output,

a beam-splitter for separating the laser pulses into first pulse portions and second pulse portions, the first pulse portions being spaced by said predetermined interval and the second pulse portions being spaced by said predetermined interval,

a mixer for combining said first pulse portions of the pulses from said first and second lasers with said frequency stable reference output to produce spaced beat frequency signals,

an amplifier for amplifying said spaced beat frequency signals,

a modulator, the amplified, spaced beat frequency signals being applied thereto, and

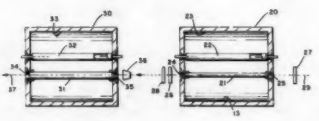
a path adapted to couple said second pulse portions of the pulses from said first and second lasers to said modulator, wherein said modulator produces output laser pulses that are coherent with respect to each other, are spaced by said predetermined interval, and have said frequency variations removed therefrom.

4,841,530

CR-DOPED SCANDIUM BORATE LASER

Bruce H. Chai, Bridgewater; Shui T. Lai, Florham Park, and Margaret N. Long, Landing, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 27, 1986, Ser. No. 845,215
Int. Cl.[4] H01S *3/16*
U.S. Cl. 372—41 **18 Claims**



1. A laser comprising:

a laser medium comprising a single crystal of $MBO_3:Cr^{3+}$,

where M is selected from the group consisting of scandium, indium and lutetium; and

means for exciting the laser medium to emit coherent radiation.

4,841,531

SEMICONDUCTOR LASER DEVICE

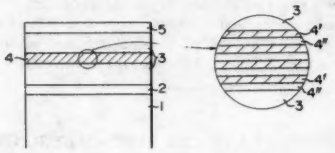
Masahiko Kondow, Kokubunji; Shin Satoh, Iruma; Shigekazu Minagawa, Tokyo; Akio Ohishi, Tokyo, and Takashi Kajimura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,058

Claims priority, application Japan, Feb. 12, 1987, 62-28207

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—43 **3 Claims**



1. In a semiconductor laser device having a double hetero structure semiconductor laser, the improvement comprising said double hetero structure semiconductor laser comprising a cladding layer of $In_{1-x-y}Ga_xAl_yP_{1-z}As_z$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 0.5$, $0.5 \leqq x+y \leqq 1$) and an active layer of a strained-layer superlattice of $In_{1-x-y}Ga_xAl_yP_{1-z}As_z$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 1$, $0 \leqq x+y \leqq 1$) system.

4,841,532

SEMICONDUCTOR LASER

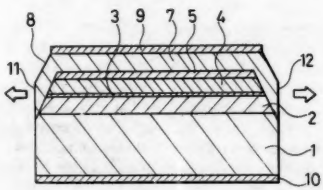
Hisao Kumabe, and Wataru Susaki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 10, 1987, Ser. No. 119,340

Claims priority, application Japan, Nov. 13, 1986, 61-270695

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—45 **10 Claims**



1. A semiconductor laser comprising sequentially disposed, on a first surface of a substrate, a first semiconductor cladding layer of a first conductivity type, an active semiconductor layer having a first band gap energy, a second semiconductor cladding layer of a second conductivity type opposite from said first conductivity type, and a semiconductor contacting layer of said second conductivity type, said first surface extending in generally perpendicular first and second directions, said second cladding layer, said active layer, and at least part of said first cladding layer having generally planar first and second ends, said ends lying in planes that are oblique to said first direction and generally parallel to said second direction, and a fifth semiconductor layer disposed at least on said ends, said fifth semiconductor layer being of said second conductivity type and having a second energy band gap larger than said first energy band gap, whereby a non-absorbing mirror structure is provided at each of said ends.

4,841,533

SEMICONDUCTOR LASER DEVICE HAVING A GRADED INDEX WAVEGUIDE

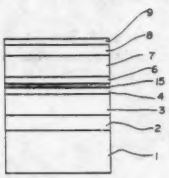
Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri; Masafumi Kondo, Tenri; Kohsei Takahashi, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1986, Ser. No. 920,585

Claims priority, application Japan, Oct. 24, 1985, 60-240162

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—45 **3 Claims**



1. In a semiconductor laser device containing a laser oscillation-operating area, the device wherein said laser oscillation-operating area comprises:

a superlatticed quantum well region which is composed of alternate layers consisting of GaAs layers and thin Al_x-$Ga_{1-x}As$ ($0 < x \leqq 1$) layers, each of said layers having a thickness of several molecular layers or less,

optical guiding layers consisting of $Al_yGa_{1-y}As$ ($x \leqq y \leqq 1$) and sandwiching said superlatticed quantum well region therebetween, the AlAs mole fraction (i.e., y) of each said optical guiding layers being continuously varied, and

cladding layers superposed on said optical guiding layers, respectively.

4,841,534

BURIED TYPE SEMICONDUCTOR LASER DEVICE

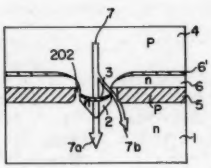
Toshihiko Yoshida; Haruhisa Takiguchi, both of Tenri; Shinji Kaneiwa, Nara; Hiroaki Kudo, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 897,337, Aug. 15, 1986. This application Aug. 5, 1988, Ser. No. 229,212

Claims priority, application Japan, Aug. 21, 1985, 60-184650; Sep. 10, 1985, 60-201161; Sep. 11, 1985, 60-202463; Sep. 12, 1985, 60-203627; Sep. 19, 1985, 60-207869

Int. Cl.[4] H01S 3/19; H01L 33/00

U.S. Cl. 372—46 **3 Claims**



1. A buried type semiconductor laser device comprising:

a multi-layered epitaxial growth crystal including a striped laser-oscillation operating area on a semiconductor substrate, said laser operating area comprising a buffer layer having the same conductivity type as said substrate, an

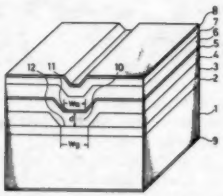
active layer, and a cladding layer having a conductivity type different from that of said substrate, wherein said laser-oscillation operating area is formed within a striped channel in the central area of said substrate and is sandwiched between one part of the burying layer and another part of the burying layer, which are formed by diffusing an impurity into the outside of the central area of said substrate, through the portion of said substrate positioned between said laser-oscillation operating area and each part of said burying layer, thereby electrically isolating said burying layer from said cladding layer.

4,841,535

SEMICONDUCTOR LASER DEVICE

Yutaka Mihashi; Yutaka Nagai, and Kenji Ikeda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 11, 1988, Ser. No. 231,003
Claims priority, application Japan, Aug. 19, 1987, 62-205764
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **6 Claims**



1. A semiconductor laser comprising a plurality of semiconductor layers serially disposed on a substrate of a first conductivity type including a first cladding layer of the first conductivity type, a current blocking layer of a second conductivity type opposite the first conductivity type and forming a rectifying junction with said first cladding layer, said current blocking layer including a longitudinal groove extending through said current blocking layer to said first cladding layer, the longitudinal groove having a transverse width along said first cladding layer, a second cladding layer of the first conductivity type disposed on said current blocking layer and in and having the configuration of the groove, a bent active layer disposed on said second cladding layer and having the configuration of the groove and spaced from said first cladding layer at said groove by the thickness of said second cladding layer, a third cladding layer of the second conductivity type, and a contacting layer of the second conductivity type, and first and second electrodes disposed on said substrate and said contacting layer, respectively, wherein a resonant cavity includes a portion of said bent active layer opposite the longitudinal groove, the width of the longitudinal groove at said first cladding layer is less than 2 microns, and the thickness of said second cladding layer at the longitudinal groove is greater than 0.6 micron.

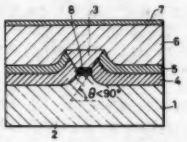
4,841,536

SEMICONDUCTOR LASER DEVICES

Aiko Ohishi, Kokubunji; Motohisa Hirao, Tokyo; Naoki Chinone; Shinji Tsuji, both of Hachioji; Hitoshi Nakamura, Kanagawa, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,685
Claims priority, application Japan, Apr. 12, 1985, 60-76745; Sep. 11, 1985, 60-199416; Feb. 28, 1986, 61-41773
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 **6 Claims**

1. In a buried hetero structure semiconductor laser, a mesa stripe having an active layer and side surfaces disposed at an acute angle to a semiconductor substrate to form a trapezoidal-like shape on the semiconductor substrate of multi-layered structure, said active layer is buried to cover the sides and top of said trapezoidal-like mesa shape and at least one p-n junction



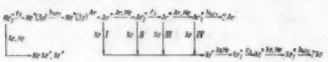
is disposed on both sides of said trapezoidal-like mesa stripe constituting a current blocking layer so that current flows only through said trapezoidal-like mesa stripe and at least one p-n junction interface is disposed between the narrowest part of said trapezoidal-like mesa shape and the upper end.

4,841,537

MEDIUM FOR GAS LASER EXCITED BY IONIZING PARTICLES

Andrei J. Alexandrov, ulitsa Volgina, 9, korpus 1, kv. 122; Viktor A. Dolgikh, ulitsa Dolgoprudnaya, 3, kv. 18; Oleg M. Kerimov, 2 Pugachevskaya ulitsa, 3,korpus 1, kv. 231; Alexei J. Samarin, ulitsa Ostrovityanova, 35a, kv. 147, all of Moscow; Igor G. Rudoi, ulitsa Sportivnaya, 7, kv.44, Moskovskaya oblast, Shatura, and Arkady M. Soroka, ulitsa Novatorov, 4, korpus 6, kv. 53, Moscow, all of U.S.S.R.

PCT No. PCT/SU88/00013, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO88/05971, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 15, 1988, Ser. No. 271,953
Claims priority, application U.S.S.R., Jan. 28, 1987, 4186717
Int. Cl.[4] H01S *3/22, 3/223*
U.S. Cl. 372—55 **1 Claim**



1. A medium for a gas laser excited by ionizing particles, containing helium, neon, argon or krypton with a total concentration of more than 10^{19} cm^{-3}, with argon or krypton concentration ranging from $3 \cdot 10^{16}$ cm^{-3} to a value which amounts to 15% of the total concentration, and at least one more component selected from the group consisting of xenon, hydrogen, hydrogen isotope, or a mixture of these components in various combinations, the concentration of each of the components or of a mixture thereof being chosen from a range from 10^{15} cm^{-3} to a value which amounts to 20% of argon or krypton concentration.

4,841,538

CO_2 GAS LASER DEVICE

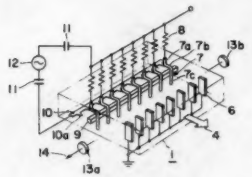
Satoru Yanabu, Machida; Hideomi Takahashi, Tokyo; Eiji Kaneko, and Koichi Yasuoka, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 21,850, Mar. 4, 1987. This application Nov. 10, 1988, Ser. No. 270,376
Claims priority, application Japan, Mar. 5, 1986, 61-31788[U]
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—58 **5 Claims**

1. A CO_2 gas laser device for generating laser light through glow discharge of a gas containing CO_2 generated between anode and cathode electrodes disposed opposite to each other

in a resonant cavity for circulating laser gas flow, the glow discharge being coaxial with the gas flow comprising:

(a) a plurality of cathode electrodes disposed in a row extending across upstream of the gas flow, each of said cathode electrodes having a first portion extending transverse to the direction of the gas flow, a second portion extending transverse to the direction of the gas flow and offset transverse from said first portion of the cathode electrodes, said second portion being disposed downstream of said first portion with respect to said gas flow,



and third portion mutually connecting adjoining ends of said first and second portions,

(b) a turbulence generating member having a rectangular cross section and disposed upstream of the center portions of the second portion of the cathode electrodes at an appropriate distance and parallel to the cathode electrodes so as to cross the gas flow; and

(c) a plurality of anode electrodes disposed transverse to the direction of the gas flow, parallel to the second portion of the cathode electrode, and downstream of and opposite to the cathode electrodes so as to cross the gas flow.

4,841,539

GAS LASER DISCHARGE TUBE WITH CERAMIC WAFERS AND COOLING WAFERS IN A STACK

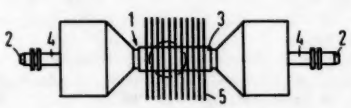
Guenther Hahn, Hoehenkirchen; Hans Krueger; Herbert Lamprecht, both of Munich, and Werner Seiffarth, Bad Aibling, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 37,202

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614912

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—63 **16 Claims**



1. In a gas laser, a discharge tube, comprising:

a stack of alternating ceramic wafers and cooling wafers, said stack including a discharge channel and at least one return channel,

said ceramic wafers lying radially closer to said discharge channel than said cooling wafers; and

mirrors carried on said discharge tube aligned with said discharge channel for laser light resonance.

4,841,540

GAS LASER ARRANGEMENT

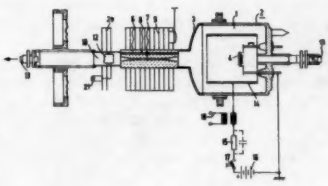
Hans Krueger, Munich; Herbert Lamprecht, deceased, late of Munich; by Thekla Lamprecht, heir; by Simon Lamprecht, heir, both of Landsberg/Lech, and Wilhelm Tiemann, Bubenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,237

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732637

Int. Cl.[4] H01S *3/097*

U.S. Cl. 372—86 **6 Claims**



1. An improved gas laser arrangement having a discharge tube arranged between a cathode and anode, said discharge tube being provided with a discharge channel and at least one gas return channel, the improvement comprising:

an auxiliary electrode in a position relative to said cathode so that an ionization is possible therebetween, and

a resistor connecting said auxiliary electrode to an operating voltage source for generating an increased spatially extensive preionization discharge in a cathode space of said gas laser arrangement.

4,841,541

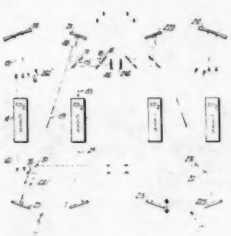
COUPLING OF RING LASERS

Edward A. Sziklas, Glastonbury, and John A. Benda, Amston, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 20, 1988, Ser. No. 221,857

Int. Cl.[4] H01S *3/083*

U.S. Cl. 372—94 **12 Claims**



1. A laser system comprising:

a first ring laser resonator having a first gain medium means for establishing an inverted population state in a first gain medium;

a first set of mirrors in a ring configuration for resonating, in predetermined radially diverging forward and reverse modes and predetermined radially converging adjoint reverse and adjoint forward modes, radiation in a first ring path passing through said gain medium, said radiation in said forward and adjoint forward modes travelling in a predetermined forward direction about said ring path and said radiation in said reverse and adjoint reverse modes travelling about said first ring path in a reverse direction

opposite to said forward direction, said adjoint forward mode being adjoint to said forward mode and said adjoint reverse mode being adjoint to said reverse mode;

first outcoupling means for extracting radiation travelling in said forward mode in said first ring path from said first ring path;

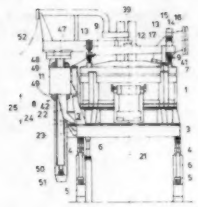
internal coupling means for coupling a predetermined coupling fraction of said radiation in one of said forward and reverse modes into a first predetermined radially converging mode adjoint to the other of said forward and reverse modes and travelling about said first ring path in a direction opposite to that of said one of said forward and reverse modes, whereby said radiation in said first predetermined radially converging mode converges radially and couples into said other of said forward and reverse modes; and

means for coupling into said ring path a second predetermined amount of external coupling radiation into a predetermined radially converging mode adjoint to said one of said forward and reverse modes, whereby said external coupling radiation converges radially and couples in phase said one of said forward and reverse modes and said one of said forward and reverse modes phase couples through said internal coupling means said other of said forward and reverse modes, so that all of said predetermined modes of said ring laser resonator are coupled in phase to said external coupling radiation.

4,841,542
ELECTRIC FURNACE ARRANGEMENT

Ernst Zajicek, Ottensheim; Ernst Riegler, Enns, and Johann Mühlbauer, Leonding, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 12, 1988, Ser. No. 193,735
Claims priority, application Austria, May 15, 1987, 1233/87
Int. Cl.[4] H05B *7/02*
U.S. Cl. 373—73 **14 Claims**



1. In an electric furnace arrangement, such as an electric arc furnace or a plasma furnace, of the type including

a furnace platform,

a furnace vessel arranged on said furnace platform,

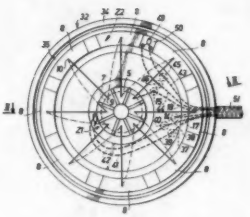
a furnace lid covering said furnace vessel,

a lid supporting framework pivotably mounted lateral of said furnace vessel for lifting, lowering and pivoting said furnace lid and including at least one lid bracket, a lid lifting mechanism for lifting and lowering said furnace lid and a lid pivoting mechanism for pivoting said furnace lid from a position above said furnace vessel into a position lateral of said furnace vessel and back, the improvement comprising oscillating crank means including a first oscillating crank hinged to said lid supporting framework pivotably connecting said lid supporting framework to said furnace platform, and a second oscillating crank provided hinged to said lid supporting framework, said supporting framework constituting a coupler to said furnace platform, thereby forming a four-bar linkage, whereby said four-bar linkage enables the lid-supporting framework to undergo a pivoting and swing motion when removing and returning said furnace lid.

4,841,543
PROBE FOR MEASURING THE THERMAL CONDUCTIVITY OF MATERIALS

André Dittmar; Georges Delhomme; Bernard Roussel, and Joseph Chatonnet, all of Lyons, France, assignors to Centre National De La Recherche Scientifique (C.N.R.S.), Paris, France

Filed Oct. 17, 1986, Ser. No. 920,241
Claims priority, application France, Oct. 23, 1985, 8515932
Int. Cl.[4] G01N *25/18*
U.S. Cl. 374—44 **12 Claims**



1. A probe for measuring the thermal conductivity of materials, comprising:

a support plate made of electrically and thermally insulating matter and having a surface defining a face of application thereby said support plate has on said surface defining said face of application a median conducting measurement zone (Z1) divided into a first plurality of heat conducting sections and at one reference measurement zone (Z2) divided into a second plurality of heat conducting sections, and whereby said median con measurement zone (Z1) is separated from said reference measurement zone (Z2) by at least one depression in said surface of said support plate defining said face of application so as to limit the thickness of said support plate in an area between said median conducting measurement zone (Z1) and said reference measurement zone (Z2) thereby reducing thermal conduction through the face of the probe;

a plurality of thermocouples comprised of interjunction connecting conductors and disposed on a portion of said support plate on said surface defining said face of application, each thermocouple having at least one hot junction and at least one cold junction, wherein said thermocouples connect said first plurality of sections of said median conducting measurement zone (Z1) and said second plurality of sections of said reference measurement zone (Z2) in series, and wherein said hot junctions are disposed on said first plurality of sections and said cold junctions are disposed on said second plurality of sections;

a heating element of planar shape disposed on said support plate at said median conducting measurement zone (Z1) and laterally offset from a plane corresponding to said face of application;

a coating of electrically insulating matter having heat conducting particles and disposed on said median conducting measurement zone (Z1) with said heating element and on said reference measurement zone (Z2);

a plurality of conductors disposed on said surface of said support plate opposite to said surface defining said face of application and connecting said heating element and said thermocouples to external driving circuitry; and

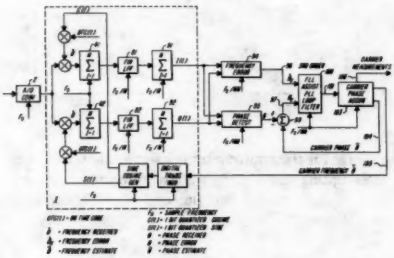
a covering of electrically and thermally insulating matter disposed on said surface of said support plate opposite to said surface defining said face of application and enclosing said plurality of thermocouples and said plurality df said conductors.

4,841,544

DIGITAL DIRECT SEQUENCE SPREAD SPECTRUM RECEIVER

Peter Nuytkens, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 14, 1987, Ser. No. 50,224
Int. Cl.[4] H04K *1/00*
U.S. Cl. 375—1 **12 Claims**



1. An improved direct sequence spread spectrum receiver for receiving and demodulating a transmitted RF carrier radio signal modulated in accordance with a transmitted code having a fundamental frequency, said radio signal being further characterized by a Doppler shift, wherein the receiver comprises

means for receiving said radio signal,

IF converter means for converting said received radio carrier signal to an IF converted signal centered about an intermediate frequency f_o corresponding to said code fundamental frequency offset by said Doppler shift,

N-bit analog to digital sampling means for sampling said IF converted signal at a sampling frequency f_s thereby forming a digitized IF converted signal including a succession of N-bit digital signals,

local IF means for developing digital local if signals, such means including

(i) means for generating digital sin (f_o) and cos(f_o) signals at said sampling frequency f_s

(ii) code generating means for generating a local code at said sampling frequency

(iii) means for multiplying the local code times each said sin(f_o) and cos(f_o) signal to obtain said local IF signals,

correlator means for correlating the digitized IF converted signal with the local IF signals so as to develop in phase and quadrature components signals, and

tracking means, responsive to the in phase and quadrature component signals for changing the sampling frequency to maintain it substantially equal to a multiple of the frequency of the digitized IF converted signal.

4,841,545

SYNCHRONOUS TRACKING DEVICE FOR DIRECT SPREAD SPECTRUM RECEIVER

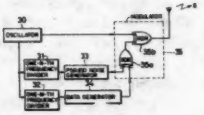
Akihiko Endo; Shigeki Takeda, and Hiroshi Takeda, all of Tokyo, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jul. 21, 1987, Ser. No. 76,185
Claims priority, application Japan, Aug. 6, 1986, 185819
Int. Cl.[4] H04B *15/00*
U.S. Cl. 375—1 **24 Claims**

7. A receiver tracking circuit for a direct-spread spectrum system in which a received signal derives from a transmitter carrier modulated by a data signal and spread by a coherent pseudonoise (PN) signal, comprising:

initial tracking means for locking on the coherent PN signal in the received signal, including shared controlled oscillator means having first and second feedback inputs, for generating a local carrier, and a local PN generator synchronized to the local carrier for generating a local PN signal to be locked onto the coherent PN signal, and PN tracking error detector means for providing a first error signal coupled as a first correction signal to the first feedback input;

despreading means for applying the local PN signal to the received signal to produce a despread signal;



final tracking means for locking on the despread signal, including the shared controlled oscillator means, the local carrier of which is to be locked on the despread signal, and phase error detector means for providing a second correction signal to the second feedback input; and

control means for holding the first correction signal at its current value and starting the final tracking means when the initial tracking means has locked on the coherent PN signal.

4,841,546

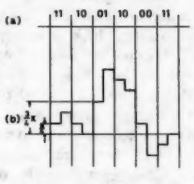
Patent Not Issued For This Number

4,841,547

DIGITAL COMMUNICATION SYSTEM

Fumio Ikegami, 5-7010 Yuniumi Manshion, 34-10 Kohatauchihata, Uji-shi, Kyoto-fu; Susumu Yoshida, Kyoto; Tsutomu Takeuchi, Kyoto, and Sirikiat Ariyavisitakul, Kyoto, all of Japan, assignors to Fumio Ikegami and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed May 8, 1987, Ser. No. 47,319
Claims priority, application Japan, May 13, 1986, 61-111673
Int. Cl.[4] H04L *27/18*
U.S. Cl. 375—53 **3 Claims**



1. A digital communication system having an improved transmission bit error rate of multi-valued information symbols transmitted through a multipath environment having two transmission paths with different transmission propagation times, said multi-valued information symbols representing at least four states, said digital communication system comprising:

information symbol input means for receiving said multivalued information symbols;

carrier wave input means for receiving a carrier wave signal;

modulating means for shifting a phase of said carrier wave signal in response to said multi-valued information symbols input by said information symbol input means during a predetermined time interval, said phase shift of said carrier wave signal including two equal phase shifts occurring during respective first and second halves of said predetermined time interval, said two equal phase shifts being in the same direction and having a predetermined magnitude corresponding to respective ones of said multivalued information symbols, said modulating means out-

putting said shifted carrier wave signal as a modulated output signal;

transmitting means for transmitting said modulated output signal from said modulation means through both paths of said multipath environment;

receiving means for receiving said transmitted signal from both paths of said multipath environment, said receiving means including means for dividing said received signal into two received output signals ; and

demodulating means for delaying, by $\frac{1}{4}$ of said predetermined time interval, one of two received output signals and multiplying the delayed signal by the other one of said two received output signals and integrating the result thereof so that the original binary information signal can be obtained.

4,841,548

METHOD AND APPARATUS FOR EXTRACTING AN AUXILIARY DATA CLOCK FROM THE CLOCK AND/OR THE CLOCK-PHASE OF A SYNCHRONOUS OR PLESIOCHRONIC DIGITAL SIGNAL

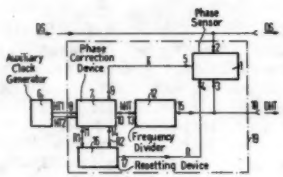
Wilhelm Volejnik, Sauerlach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 116,663

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640431

Int. Cl.[4] H04L 7/02

U.S. Cl. 375—110 **14 Claims**



4. Apparatus for extracting an auxiliary data clock (DHT) from the clock of a digital signal (DS), comprising:

a fixed frequency auxiliary clock generator for generating an auxiliary clock (HT) having a fixed frequency;

a phase sensor for receiving and sensing the phase difference between the digital signal (DS) and the auxiliary clock (DHT) and producing a correction signal (K);

a phase correction device connected to said auxiliary clock generator and to said phase sensor and operable to select a fixed frequency clock generated by the auxiliary clock generator to produce a corrected auxiliary clock (kHT) as the auxiliary data clock (DHT).

4,841,549

SIMPLE, HIGH PERFORMANCE DIGITAL DATA TRANSMISSION SYSTEM AND METHOD

Stephen L. Knapp, 1776 Oakdale St., Pasadena, Calif. 91106

Filed Mar. 21, 1988, Ser. No. 170,551

Int. Cl.[4] H04L 7/04

U.S. Cl. 375—111 **8 Claims**

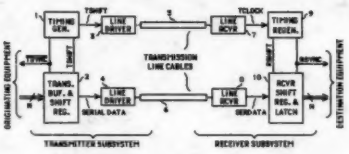
1. A communication system for transmitting data from a sending station to a receiving station comprising:

first channel means for carrying message timing information from the sending station to the receiving station;

at least one second channel means for carrying message data information from the sending station to the receiving station;

means for transmitting timing signals from the sending station to the receiving station over the first channel means at a frequency which may be varied over a predetermined range in accordance with at least one characteristic of the first and second channel means; and

means for transmitting data signals from the sending station to the receiving station over the second channel means at said frequency, the data signals representing data words;



the means for transmitting timing signals including means for interrupting the timing signals following each group of data signals to indicate the end of each corresponding word.

4,841,550

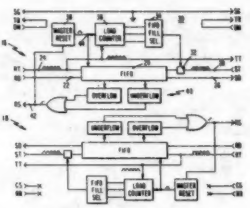
UNIVERSAL NULL DTE

Michael George; Lyndon G. Pierson, and Mark E. Wilkins, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 9, 1987, Ser. No. 118,075

Int. Cl.[4] H04L 7/00

U.S. Cl. 375—118 **17 Claims**



1. In a multi-segment communication network having at least two segments, each segment having a clock source for generating a data communication rate and data communication equipment (DCE) for communicating with another segment, the improvement comprising:

data terminal equipment means for interfacing between two segments of the communication network;

said terminal equipment means including: first input means for receiving receive clock signals from a first DCE in a first segment;

buffer means for receiving data from the first DCE, second input means for receiving send clock signals from a second DCE in a second segment;

transmitting means for transmitting data from said buffer means to the second DCE responsive to said send clock signals generated by said second DCE; and

preload means for loading said buffer means to a predetermined selectable level prior to activating said transmitting means to transmit said data to said second DCE;

said preload means including:

gating means for permitting said send clock signals from the second DCE to activate said buffer means to provide stored data to said transmitting means; and

enabling means operable for enabling said gating means to pass said send clock signals from the second DCE to said

buffer means only after said buffer means has been filled to a selected level.

4,841,551

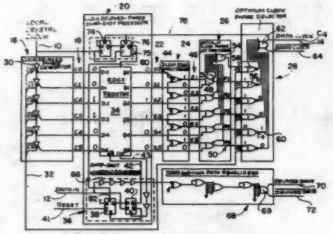
HIGH SPEED DATA-CLOCK SYNCHRONIZATION PROCESSOR

Napoleon G. Avaneas, Kings Park, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 7,504, Jan. 5, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 205,582

Int. Cl.[4] H04L *7/00;* **H03K** *5/00;* **H03D** *3/24*

U.S. Cl. 375—118 **7 Claims**



1. A synchronizing circuit for generating a data clock from a local clock, the circuit comprising:

multiple tap active delay line means connected to the local clock for generating delayed clock phases constituting a first signal set;

means connected at its input to the first set for sampling the clock phases during a preselected timing interval following receipt of data by the circuit to produce second signal set, the sampling means comprising:

(a) a register having inputs connected to respective clock phases;

(b) means enabled by a reset signal and triggered by initial incoming data for strobing the register to enable writing of the first set from the register and producing the sampled clock phases continuously regardless of subsequent input data;

means for selecting an optimum clock phase by detecting the occurrence of a preselected transition in a sampled clock phase; and

terminal means connected to an output of the selecting means for making available the optimum clock phase as a data clock during the time period when data is received, the selecting means including a plurality of gates, each gate having

(a) a first input connected to a corresponding delayed clock phase at the delay line means; and

(b) second and third inputs connected to sequentially adjacent signals of the second set for determining which delayed clock phase has undergone a desired transition during a sampling interval thereby representing an optimum phase;

the selecting means further including digital summing means connected at its input to the outputs from all the gates for producing the delayed optimum clock phase as a data clock.

4,841,552

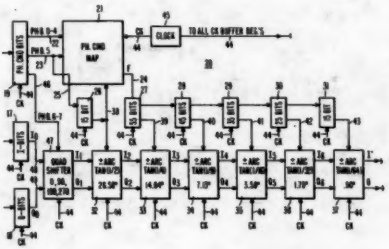
DIGITAL PHASE SHIFTER

Samuel C. Kingston, Salt Lake City, Utah, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 4, 1988, Ser. No. 177,283

Int. Cl.[4] H03K *5/153, 5/135*

U.S. Cl. 377—43 **8 Claims**



1. A digital phase shifter comprising:

a phase command register for receiving phase commands in the form of a digital number,

an inphase register and a quadrature register for receiving real and imaginary components of a complex number representative of base band data,

a quadrature shifter coupled to said inphase and quadrature registers and to said phase command register for shifting the phase of said real and imaginary components,

command map means coupled to said phase command register for receiving a phase command and for generating a plurality of plus and minus phase shift command bits,

a plurality of plus or minus phase shifters coupled to said plus or minus phase shift command bits and to the output of said quadrature shifter, and

said plurality of plus or minus phase shifters being connected in series to perform plus or minus phase shifts of predetermined angles that diminish by a factor of approximately one-half from the previous phase shift angle.

4,841,553

METHOD OF AND APPARATUS FOR CARRYING OUT TOMOGRAPHY

Hideo Nagai, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00496, § 371 Date May 19, 1987, § 102(e) Date May 19, 1987, PCT Pub. No. WO87/02158, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 27, 1986, Ser. No. 57,970

Claims priority, application Japan, Sep. 30, 1985, 60-216778

Int. Cl.[4] G06F *15/42*

U.S. Cl. 378—19 **3 Claims**

1. A method of carrying out tomography, comprising the steps of

rotation a radiation source and a multichannel radiation detector about a subject to be examined, said radiation source being disposed so as to generate a fan beam of radiant rays, said multichannel radiation detector having an offset arrangement and being disposed in opposition to said radiation source with said subject being interposed therebetween;

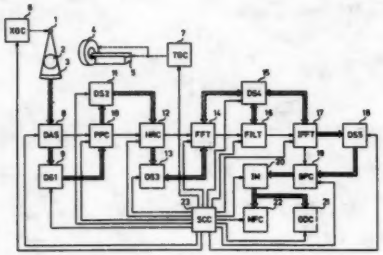
applying said fan beam of radiant rays in a direction parallel with a chosen section of said subject;

measuring said chosen section of said subject in a plurality of directions parallel therewith so as to obtain data representative of a distribution of intensity of transmitted radiant rays;

obtaining measurement data in the form of an array corresponding to said fan beam in respective directions; and

reconstructing a tomogram of said subject from said mea-

surement data, wherein a set of data is obtained based on radiant ray beams advancing in an opposite direction along the same paths as those of radiant rays providing said measurement data, then the set of data is inserted



between an adjacent corresponding set of measurement data prior to convolution or filtering to thereby increase the amount of measurement data, and then reconstructing an image using the increased amount of measurement data.

4,841,554

X-RAY SCANNER FOR INSPECTING ARTICLES MOVING THERETHROUGH

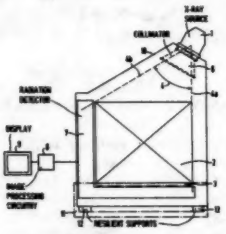
Gerhard Doenges, Heidenrod-Kemel; Rolf Dietrich, Hofheim; Helmut Thoma, Mainz, and Eckart-Alfred Von Unger, Munich, all of Fed. Rep. of Germany, assignors to Heimann GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,991

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 8703674

Int. Cl.[4] G01N *23/04*

U.S. Cl. 378—57 **2 Claims**



1. An x-ray scanner comprising:

an x-ray source which generates an x-ray beam emanating from a focus;

a collimator disposed with respect to said x-ray source for collimating said x-ray beam to generate a fan-shaped x-ray beam;

means for conveying a series of articles to be inspected through said fan-shaped x-ray beam;

a radiation detector disposed for receiving radiation from said x-ray beam attenuated by said articles and generating electrical signals corresponding to the intensity of the received radiation;

means for generating a visual image of said articles based on said signals;

a rack on which at least said means for conveying is mounted;

a frame to which said x-ray source, said collimator and said radiation receiver are mounted, said frame being resistant to flexural and torsional stresses; and

resilient means disposed between said frame and said rack for mounting said frame to said rack to substantially insulate said frame and the components mounted thereon from mechanical stresses caused by the operation of said means for conveying.

4,841,555

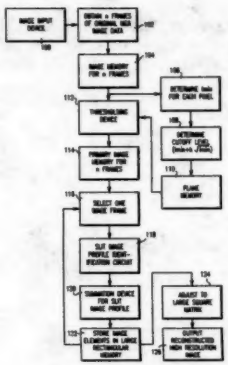
METHOD AND SYSTEM FOR REMOVING SCATTER AND VEILING GLATE AND OTHER ARTIFACTS IN DIGITAL RADIOGRAPHY

Kunio Doi, Willowbrook, and Yuichiro Kume, Clarendon Hills, both of Ill., assignors to University of Chicago, Chicago, Ill.

Filed Aug. 3, 1987, Ser. No. 81,001

Int. Cl.[4] H05G *1/64*

U.S. Cl. 378—99 **18 Claims**



8. A system for reconstructing an image obtained from plural sequential exposures of an object by a radiation source comprising:

multiple slit beam scanning means positioned between the source and the object for exposing said object with radiation emanating from said source and passing through said scanning means;

means for performing plural successive image acquisition steps in which successive frames of original image data each in the form of plural pixels are acquired at said plural successive image data acquisition steps during relative movement of said source and said scanning means;

means for determining for each pixel a minimum value (I_{min}) of image data acquired during the successive image data acquisition steps;

means for comparing the image data of each pixel acquired for each frame with a comparison cutoff value which bears a predetermined relationship to the minimum pixel value for that frame;

means for summing for each pixel all of the values of original image data which exceed said cutoff value for all of said frames of original image data; and

means for outputting a reconstructed image data based at least in part on the sums produced by said summing means.

17. A system for reconstructing an image obtained from plural sequential exposures of an object by a radiation source, comprising:

multiple slit beam scanning means positioned between the source and the object for exposing the object with radiation emanating from said source and passing through said scanning means;

means for producing relative movement between the source and the scanning means;

means for performing plural successive image acquisition steps in which successive frames of original image data

each in the form of a matrix of plural pixels are acquired at each of said plural image data acquisition steps upon relative movements of said source and said scanning means;

said scanning means having a slit beam width selected to be narrower than a pixel size of the pixel matrix at an image plane of said means for performing plural image acquisition steps;

means for producing based on said original image data a series of image data derived from radiation passing through a common slit of the scanning means in consecutive image acquisition steps;

means for forming an enlarged pixel matrix by assigning said series of image data to a respective series of adjacent pixels arranged in a direction perpendicular to the scanning beams of said scanning means in the enlarged pixel matrix; and

means for forming an image based at least in part on said series of image data assigned in said enlarged pixel matrix.

4,841,556

PLASMA X-RAY SOURCE

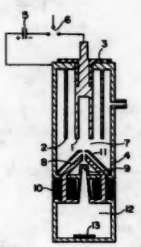
Yasuo Kato, Zama; Isao Ochiai, Hachioji; Yoshio Watanabe, Tokyo, and Seiichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 12,992

Claims priority, application Japan, Mar. 7, 1986, 61-48258

Int. Cl.[4] H01J *35/00*

U.S. Cl. 378—119 **5 Claims**



1. A plasma X-ray source comprising:

an inner cylindrical electrode;

an outer cylindrical electrode disposed coaxially with the inner cylindrical electrode, with a desired gap therebetween;

an electrically insulating member provided between the inner cylindrical electrode and the outer cylindrical electrode so that breakdown occurs along a surface of said electrically insulating member when high voltage is applied between the electrodes;

a discharge vessel containing the inner and outer cylindrical electrodes therein and filled with a gas selected from a group consisting of neon, argon, kyrpton and xenon and mixtures thereof, said gas being convertible into a plasma; and

means for applying a pulse voltage between the inner and outer cylindrical electrodes so that the inner cylindrical electrode is at a negative potential with respect to the outer cylindrical electrode, to generate the plasma within the discharge vessel.

4,841,557

X-RADIATOR WITH CIRCULATING PUMP FOR HEAT DISSIPATION

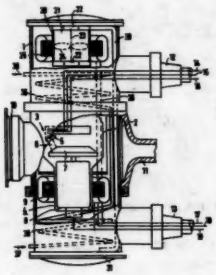
Klaus Haberrecker, Bubenreuth, and Rainer Roth, Dormitz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,704

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 8531503[U]

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—141 **17 Claims**



1. An x-radiator having a housing containing heat-emitting components, an insulating fluid filling the interior of said housing surrounding said components, and a pump means mounted integrated with said housing in fluid communication with the interior of said housing for circulating said fluid for at least partially dissipating the heat from said components, said pump means including a fluid mover, a first port disposed at one end of said housing proximate said fluid mover, and a second port disposed at an opposite end of said housing, said fluid mover being connected to said second port by a conduit integrated with said housing to move said fluid over said components in one direction between said ports.

4,841,558

FRONT PLATE FOR X-RAY CASSETTES

Shoji Kaneko, Saitama, and Atsumi Nakamura, Chiba, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 94,784

Claims priority, application Japan, Sep. 10, 1986, 61-138829[U]

Int. Cl.[4] B32B *5/12*; G03B *42/04*

U.S. Cl. 378—182 **9 Claims**

1. An x-ray film cassette comprising:

a front plate;

a frame extending from the periphery of said front plate; and

a rear plate coupled to said frame; said front plate comprising an intermediate layer made up of synthetic fiber reinforced resin layers, two outer layers made up of carbon fiber reinforced resin layers, said two outer layers being laid on the outer surfaces of said intermediate layer, respectively and two outermost layers made up of synthetic fiber reinforced resin layers, said two outermost layers

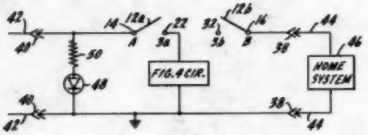
being laid on the outer surfaces of said outer layers, respectively, thus forming a multi-layer structure.

4,841,559

TELEPHONE NETWORK INTERFACE TESTER

Guy T. Curtis, Ashburnham, Mass., assignor to TriTech Laboratories, Inc., North Andover, Mass.

Filed Apr. 29, 1988, Ser. No. 187,959
Int. Cl.[4] H04M *1/24*
U.S. Cl. 379—27 **20 Claims**



1. A device for interposing in a multiple conductor telephone service line for testing the service line and a telephone network attached to the service line comprising:

a. connector means for connecting the device in circuit between the telephone service line and the telephone network,

b. first circuit means for testing said service line, including an amplifier for amplifying electrical signals on said service line and a transducer connected to said amplifier to produce an audible representation of said amplified electrical signals,

c. second circuit means for testing said telephone network, including indicator means for identifying a plurality of conditions of said telephone network, and

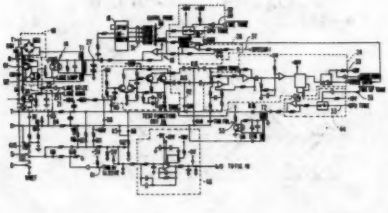
d. means for switching between said first and second circuit means.

4,841,560

DIRECT ACCESS TEST UNIT FOR CENTRAL OFFICE

Aaron Chan, Moorpark; Ben Pierce, Thousand Oaks, and Leslie Shafto, Camarillo, all of Calif., assignors to Harris Corp., Melbourne, Fla.

Filed Oct. 16, 1987, Ser. No. 109,164
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—29 **30 Claims**



1. A direct access test unit to be connected in a telephone office for testing subscriber lines in response to commands from a remote telephone facility comprising:

a first access port coupled to an access line circuit by way of which said remote telephone facility communicates with said telephone office in the course of testing subscriber lines;

a second access port, coupled to a test trunk circuit, by way of which a subscriber line is placed in a prescribed electrical test condition by said test unit in accordance with a prescribed test to be conducted on said subscriber line circuit; and

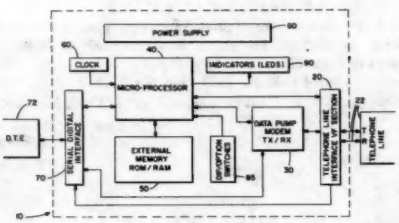
subscriber line test means, coupled to said first and second access ports, and responsive to a command supplied from said remote telephone facility via said access line circuit to said first access port, representative of a command to conduct a test of the subscriber line circuit to which said remote telephone facility is connected, for placing said subscriber line circuit in a prescribed electrical test condition via said second access port in accordance with a prescribed test of said subscriber line circuit.

4,841,561

OPERATING DEFAULT GROUP SELECTABLE DATA COMMUNICATION EQUIPMENT

Gregory P. Hill, Naugatuck, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Dec. 8, 1987, Ser. No. 129,983
Int. Cl.[4] H04M *1/26, 11/00*
U.S. Cl. 379—97 **17 Claims**



1. A data communication apparatus for use in a plurality of countries having at least one different operating parameter, comprising:

(a) receiving means for receiving signals communicated over a communications channel;

(b) transmitting means for transmitting signals out over a communications channel;

(c) a memory means for storing the predetermined values of at least one operating parameter including at least one hardware related operating parameter for a plurality of countries;

(d) means for changing a hardware configuration of said data communication apparatus in accord with said at least one hardware related parameter value; and

(e) processing means connected to said receiving means, said data transmitting means, said means for changing the hardware configuration, and said memory means, said processing means being arranged

to process said received signals and send relevant information to a data terminal,

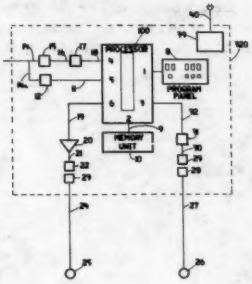
to obtain signals from a data terminal, process the obtained signals, and send relevant information to said data transmitting means, and

to obtain parameter values stored in said memory means, said parameter values permitting said processing means to cause said means for changing the hardware configuration to assume a proper configuration so as to permit said data communication apparatus to function in accord with the operating parameter requirements of the country in which said data communication apparatus is to be used.

4,841,562
TELEPHONE VCR CONTROL

Steven Lem, 3711 Brayton Ave., Long Beach, Calif. 90807

Filed Jul. 24, 1987, Ser. No. 77,439
Int. Cl.[4] H04M *11/00*; J04Q *9/00*
U.S. Cl. 379—104 4 Claims



1. A processor based controller for a video cassette recorder, comprising:

a transceiver means to electrically connect to a telephone line to transmit or receive signals,

a converter means to convert Touch Tone signals to digital words,

an amplifying means to increase said processor's signal to an infrared light emitting device.

an infrared light emitting device coupled to a first fiber optic assembly which transfers said diode's light output to the VCR's remote sensor,

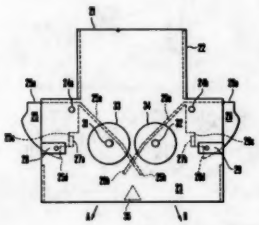
a light detecting and quantifying means to receive light transferred by a second fiber optic assembly from the VCR's channel display, and to convert its intensity into a digital word, and a memory unit for storing programmed functions of the controller,

a data entry means for entering codes to modify the processor's operations to suit different types of VCR.

4,841,563
BUCKET TYPE COIN ACCUMULATION APPARATUS

Yoshii Sano; Hideo Totsu, and Toshiharu Morihisa, all of Tokyo, Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 135,006
Claims priority, application Japan, Jan. 12, 1987, 62-3271
Int. Cl.[4] H04M *17/02*
U.S. Cl. 379—150 9 Claims



1. A bucket type coin accumulation apparatus comprising:

a collection plate and a return plate, both of which constitute a bottom portion of a coin accumulation bucket and cooperate to randomly accumulate coins in said coin accumulation bucket;

locking means for independently locking said collection plate and said return plate when a coin is inserted;

biasing means for independently urging said collection plate and said return plate in a counter-gravity direction by a biasing force smaller than a weight of one coin and for causing said collection and return plates to wait at home positions, respectively;

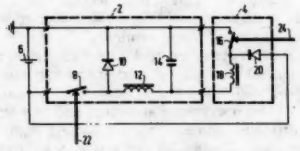
detecting means for detecting whether said collection plate and said return plate are located at the home positions of said collection plate and said return plate defined by biasing by said biasing means; and display means for displaying an out-of-order state when said detecting means detects in the initial state without any coin deposited that neither said collection plate nor said return plate is located at the home position;

whereby one of said collection plate and said return plate is released by the weight of the accumulated coin upon selective unlocking of said locking means to selectively collect or return the accumulated coin, and the presence/absence of coin accumulation is discriminated by an output from said detecting means.

4,841,564
DC-SUPPLY ARRANGEMENT FOR A TELECOMMUNICATION LINE

Franciscus A. C. M. Schoofs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 17, 1987, Ser. No. 63,341
Claims priority, application Netherlands, Jul. 8, 1986, 8601774
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—413 4 Claims



1. An improved switched-mode DC power supply circuit for a telecommunications line on which common mode currents may occur, such circuit being connectable to a DC source having a pair of terminals one of which is earthed and the other of which is a DC supply voltage terminal, such circuit having a pair of output terminals between which an output capacitor is connected, a terminal of said capacitor being directly connected to said earthed terminal of said DC source, said capacitor being charged from said supply voltage terminal by a first switched DC converter comprising a first switching element which is periodically switched by a first periodic control signal having a variable duty cycle so as to maintain the voltage across the output terminals of said circuit at a preselected level, said capacitor also being charged by said common mode currents;

such improvements being characterized in that said power supply circuit further comprises a second switched DC converter having a second switching element and inductor connected in series across said capacitor, said second converter further having a diode connecting the junction of said second switching element and said inductor to said supply voltage terminal, said second switching element being periodically switched by a second periodic control signal which becomes operative when the duty cycle of said first periodic control signal has been reduced substantially to zero;

said second converter transferring charge from said capacitor to said DC source so as to maintain the voltage across the output terminals of said circuit at said preselected level

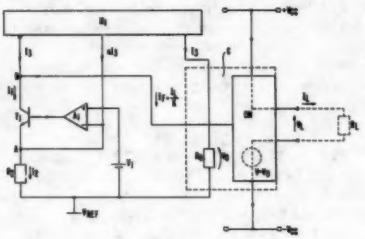
despite charging of said capacitor by said common mode currents.

4,841,565

MONOLITHICALLY INTEGRATABLE TELEPHONE CIRCUIT FOR FEEDING A SUBSCRIBER'S TELEPHONE LINE

Marco Siligoni, Vittuone; Vanni Saviotti, Monza, and Emilio Lorena, Parona, all of Italy, assignors to SGS Microelettronica SpA, Milan, Italy

Filed Apr. 30, 1986, Ser. No. 857,487
Claims priority, application Italy, Apr. 30, 1985, 20549 A/85
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—413 **1 Claim**



1. A monolithically integratable telephone circuit for feeding a subscriber's telephone line, comprising:

a current mirror circuit having an input and first and second outputs; a transistor having first, second and control terminals; an operational amplifier having an output terminal and first and second input terminals;

wherein said input of said current mirror circuit is connected to said second terminal of said transistor; said control terminal of said transistor is connected to said output terminal of said operational amplifier; said first terminal of said transistor is connected to said second input terminal of said operational amplifier and is connected to a voltage reference via a first resistance; said first input terminal of said operational amplifier is connected to said voltage reference via a voltage generator; said first output of said current mirror circuit is connected to said second input terminal of said operational amplifier and said second output of said current mirror circuit is connected to said voltage reference via a second resistance;

said circuit further comprising a circuit means for coupling said subscriber's telephone line to a supply voltage generator having first and second terminals, said circuit means having first and second terminals connected to said first and second terminals of said supply voltage generator and having third and fourth terminals connected to a first and second wire respectively of said subscriber's line; said circuit coupling means comprising at least one additional voltage generator for outputting a voltage in accordance with a resultant voltage across said second resistance, and a circuit current transducer means, inserted between at least one of the first and second terminals of said circuit means which is connected to said subscriber's telephone line and said input of said current mirror circuit.

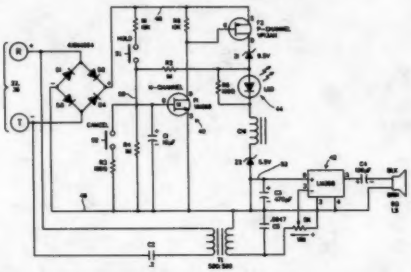
4,841,566

HOLD AND DIAL ACCESSORY FOR TELEPHONE INSTRUMENT

Thomas M. Lott, 55 W. Santa Inez, San Mateo, Calif. 94402

Filed Feb. 22, 1988, Ser. No. 158,867
Int. Cl.[4] H04M *1/26*
U.S. Cl. 379—352 **8 Claims**

1. A hold and dial monitor accessory for use with a conventional telephone instrument connected across a subscriber service pair extending from a central office, the hold and dial monitor accessory being bridge connected across the telephone service pair and including manually actuable and releasable line seize circuit means for holding a communication loop through the central office and having an internally established time constant for automatic line release, and audio amplifier and loudspeaking circuit means for amplifying audio information present on the telephone service pair during the interval when the line seize circuit means is holding the communication loop, the line seize circuit means comprising an enhancement



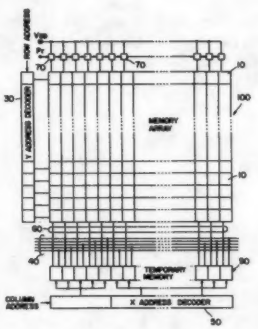
mode field effect transistor having source and drain elements in series connection across the tip and ring wires of said telephone service pair and a gate connection selectively connectable to one of the tip and ring wires in order to place a low impedance load across the tip and ring wires and thereafter selectively connectable to the other of the tip and ring wires in order to release the low impedance load, there being charge storage capacitor and discharge resistor means connected between the gate and the other of the tip and ring wires in order to establish said internally established time constant.

4,841,567

MEMORY DEVICE

Eiji Masuda, Kawasaki; Yasuhiko Fujita, Tokyo, and Terufumi Takasaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 893,906, Jul. 22, 1986, abandoned. This application Sep. 21, 1988, Ser. No. 246,965
Claims priority, application Japan, Jul. 22, 1985, 60-161626
Int. Cl.[4] H04M *1/272*
U.S. Cl. 379—355 **9 Claims**



1. A memory device comprising:

a first memory array having a plurality of first RAM cells arranged as a matrix, each of said first RAM cells being accessed by a column address and a row address;

a second memory array having a plurality of second RAM cells arranged along a row, each of said second RAM cells

being accessed by a column address so as to store and transfer data from or to said first memory array;

a plurality of bus lines connected to said second memory array so as to read out data from said first memory array or to write data into said first memory array through said second memory array;

a plurality of data lines connected between said first memory array and said second memory array so as to transfer data between said first memory array and second memory array;

an X address decoder which outputs a column address of said matrix to said first memory array through said second memory array; and

a Y address decoder which outputs a row address of said matrix to said first memory;

whereby, in a read-out operation, data stored in said first memory array is simultaneously transferred to said second memory array through said data lines and stored in said second memory array, and subsequently outputted at different times from said second memory array to the bus lines, and in a write-in operation, data from the bus lines is outputted to and stored in said second memory array at different times and subsequently simultaneously transferred from said second memory array to said first memory array along said data lines.

4,841,568

CIRCUIT ARRANGEMENT FOR A TELEPHONE STATION WITH EARTH CONNECTION TO THE CENTRAL SUPPLY DEVICE

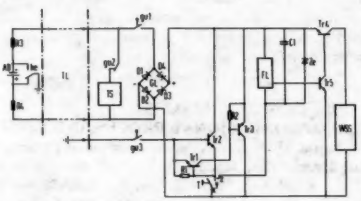
Juergen Riesmeyer, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,319

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709537

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—380 **1 Claim**



1. A circuit arrangement for a telephone station with earth connection to a central supply device for the purpose of post-dialing said telephone station having a dialing and speech circuit, a polarity reversal protection device and a flash circuit, comprising, in combination a key (T) with a double-make contact (y,z), a fixed contact side of which is connected to a negative terminal of the polarity reversal protection device (GL), a rest side of a first actuated make contact (y) being connected to the base of a first NPN-transistor (Tr1) and, via a resistor (R1) to the emitter of said NPN-transistor (Tr1) and to earth potential, and in the actuated state, interconnects output terminals of the polarity reversal protection device (GL) via the collector-emitter path of a second NPN-transistor (Tr2) which is connected by its base to earth potential, the collector of said first NPN-transistor (Tr1) is connected to the base of a PNP-transistor (Tr3) whose emitter-collector path is connected between said output terminals of the polarity reversal protection device (GL), and connected to a rest side of a second actuated make contact (z), which is selectively connected to the first make contact (y) and to a positive output of the polarity reversal protection device (GL) via a Zener Diode (Ze), which is arranged in parallel to the flash circuit and in parallel to a supply capacitor (C1).

4,841,569

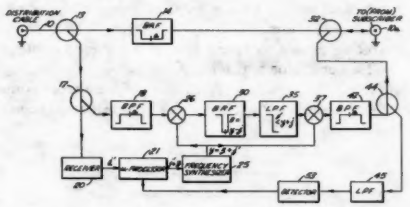
SECURE VIDEO DISTRIBUTION SYSTEM

David E. Wachob, Elkins Park, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,459

Int. Cl.[4] H04N *7/167*; H04K *3/00*

U.S. Cl. 380—7 **16 Claims**



1. In combination in apparatus for electronically restoring a video program which includes an in-band jamming wave characterized by a time varying frequency, means for receiving the jammed video program, a band reject filter, heterodyning means having first and second inputs and an output connected to said band reject filter; said receiving means coupling the video program having the variable frequency jamming wave to said first input of said heterodyning means, and means for supplying to said second input of said heterodyning means a signal of time varying frequency appropriate to heterodyne the changing frequency of the jamming signal to that of the band reject filter.

4,841,570

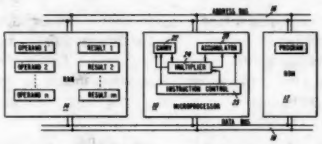
ONE-WAY TRANSFORMATION OF INFORMATION

James A. Cooper, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 11, 1987, Ser. No. 48,433

Int. Cl.[4] H04K *1/00*

U.S. Cl. 380—30 **22 Claims**



1. A method for one-way transformation of data to generate an encrypted form thereof by obtaining a modulo-k representation of a product of at least first and second numbers in an n-bit computer where $2^n \neq k$, said computer having a multiplying apparatus including an n-bit accumulator register and an n-bit carry register, comprising the steps of:

inputting a first number G from an input source to the computer,

obtaining a second number H,

using said multiplying apparatus to obtain a product J—G*H,

storing said product in said accumulator and carry registers,

transforming the product to obtain a unique one-way encrypted transform thereof,

said transforming step comprising the step of obtaining a

modulo-k representation, $J_k=(G*H) \bmod k$, of the product by performing the further steps of:

comparing the contents of said accumulator and carry registers to determine a relation therebetween,

selecting a function dependent on the results of said comparing step,

applying the selected function to the contents of said carry register,

generating signals representative of the selected function of the contents of said carry register,

transferring said generated signals to the accumulator register,

altering said accumulator register in response to said signals transferred thereto,

generating signals representative of the altered contents of said accumulator register and

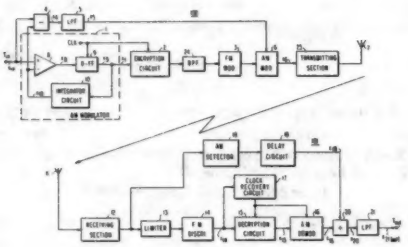
outputting said signals representative of the altered contents of said accumulator register as the transformed representation J_k.

4,841,571

PRIVACY SIGNAL TRANSMISSION SYSTEM

Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,567
Claims priority, application Japan, Dec. 22, 1982, 57-223892
Int. Cl.[4] H04K *1/10*
U.S. Cl. 380—31 **9 Claims**



1. A privacy signal transmission system comprising:

a transmitter including digital pulse modulator means for converting a first analog signal into a first digital signal said digital pulse modulator means including means for converting the first digital signal into a second analog signal, encryption means for converting the first digital signal into a first digital privacy signal, subtractor means for producing a first analog error signal representative of the difference between said second signal provided by analog conversion of the first digital signal and the first analog signal, and transmission means for transmitting a modulated signal in response to the first analog error signal and the first digital privacy signal; and

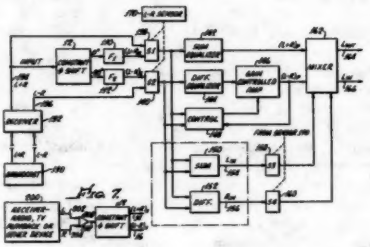
a receiver including means for receiving the modulated signal including the first analog error signal and the first digital privacy signal to generate a second analog error signal and a second digital privacy signal, decryption means for converting the second digital privacy signal into a second digital signal, digital pulse demodulator means for converting the second digital signal into a third analog signal, and reproduction means for reproducing the first analog signal by adding the second analog error signal to the third analog signal.

4,841,572

STEREO SYNTHESIZER

Arnold I. Klayman, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1988, Ser. No. 167,615
Int. Cl.[4] H04S *1/00*
U.S. Cl. 381—17 **19 Claims**



1. A system for generating stereo image enhanced output signals from a monaural input signal having a bandwidth, said system comprising:

first means responsive to the monaural input signal for generating a simulated sum signal which comprises different frequencies,

second means responsive to the input signal for generating a simulated difference signal that is delayed with respect to said simulated sum signal and which has components of said different frequencies, each such component in said second means having a different time delay with respect to a corresponding component in said first means, each said first and second means comprising phase shift means for providing each different delay time as a substantially fixed phase separation between corresponding bands of said simulated sum and said simulated difference signals over a portion of said bandwidth of frequencies.

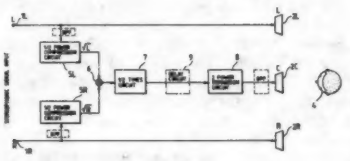
stereo image enhancement means responsive to said simulated sum and difference signals for generating stereo enhanced left and right output signals.

4,841,573

STEREOPHONIC SIGNAL PROCESSING CIRCUIT

Shinichi Fujita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Aug. 29, 1988, Ser. No. 237,986
Claims priority, application Japan, Aug. 31, 1987, 62-217521
Int. Cl.[4] H04S *3/00*
U.S. Cl. 381—27 **3 Claims**



1. A stereophonic signal processing circuit, comprising;

a first channel signal input terminal;

a first level compression circuit connected to said first channel signal input terminal and compressing a peak level of a first channel signal inputted to said first channel signal input terminal, into $\frac{1}{k}$ power of the level;

a second channel signal input terminal;

a second level compression circuit connected to said second channel signal input terminal and compressing a peak

level of a second channel signal inputted to said second channel signal input terminal, into ½ power of the level;

an arithmetic mean circuit connected to individual output terminals of said first and second level compression circuits and determining an arithmetic mean between individual output signals emanating from said first and second level compression circuits; and

a level expansion circuit connected to an output terminal of said arithmetic mean circuit and expanding a peak level of an output signal emanating from said arithmetic mean circuit, into 2nd power of the level,

an output signal emanating from said level expansion circuit being produced as a third channel signal to be reproduced midway between individual reproducing positions of said first and second channel signals.

4,841,574

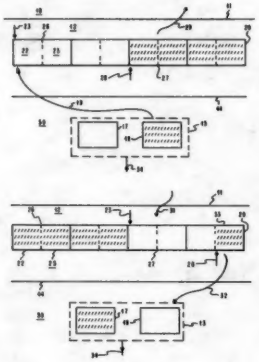
VOICE BUFFER MANAGEMENT

Xuan N. Pham, and John H. Wilson, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,914

Int. Cl.[4] G01L *3/00*

U.S. Cl. 381—31 **7 Claims**



1. A voice buffering system, comprising:

means for receiving a substantially endless stream of digitized voice data representing an essentially continuous, intelligible speech message;

means for storing the received substantially endless stream of digitized voice data at a first rate;

means for controlling a transfer of the substantially endless stream of digitized voice data into and out of the storing means; and

means, response to the controlling means, for outputting, in real time, the stored substantially endless stream of digitized voice data, wherein said essentially continuous, intelligible speech message remains intact at a second rate.

4,841,575

IMAGE ENCODING AND SYNTHESIS

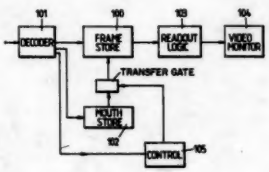
William J. Welsh, Ipswich; Brian A. Fenn, Woodbridge, and Paul Challener, Ipswich, all of England, assignors to British Telecommunications public limited company, Great Britain

Filed Nov. 14, 1986, Ser. No. 930,473

Claims priority, application United Kingdom, Nov. 14, 1985, 8528143

Int. Cl.[4] G10L *5/02*

U.S. Cl. 381—36 **17 Claims**



1. An apparatus for encoding a moving image including a human face comprising:

means for receiving video input data;

means for output of data representing one frame of the image;

identification means arranged in operation for each frame of the image to identify that part of the input data corresponding to the mouth of the face represented and

(a) in a first phase of operation to compare the mouth data parts of each frame with those of other frames to select a representative set of mouth data parts, to store the selected parts and to output the selected parts;

(b) in a second phase to compare the mouth data part of each frame with those of the stored set and to generate a codeword indicating which member of the set the mouth data part of that frame most closely resembles.

301,656

ELEMENT OF A SHOE SOLE

Juan A. Diaz, Weymouth, Mass., assignor to Reebok International Ltd., Canton, Mass.

Filed Jul. 16, 1987, Ser. No. 74,320

Term of patent 14 years

U.S. Cl. D2—314

301,657

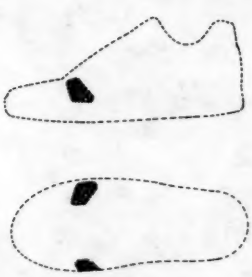
ELEMENT OF A SHOE UPPER

Paul D. Brown, Hingham, Mass., assignor to Reebok International Ltd., Canton, Mass.

Filed Sep. 8, 1987, Ser. No. 93,689

Term of patent 14 years

U.S. Cl. D2—314



301,658

SHOE SOLE

Yoshiaki Hase, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan

Filed Jun. 4, 1986, Ser. No. 870,693

Claims priority, application Japan, Dec. 27, 1985, 60-54422

Term of patent 14 years

U.S. Cl. D2—320

301,659

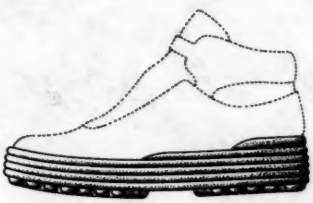
SHOE OUTSOLE

Tuan Le, New York, N.Y., assignor to Reebok International Ltd., Canton, Mass.

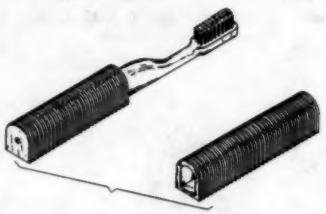
Filed Oct. 6, 1988, Ser. No. 254,124

Term of patent 14 years

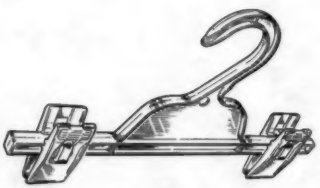
U.S. Cl. D2—320

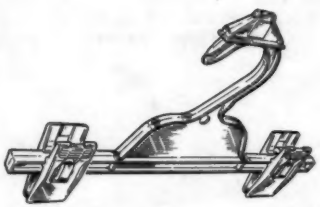


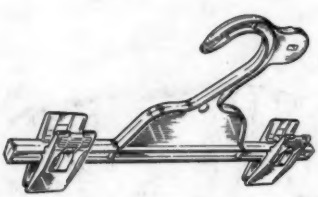
301,660
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed Dec. 30, 1987, Ser. No. 139,703
Term of patent 14 years
U.S. Cl. D4—108



301,661
GARMENT HANGER
Ronald M. Wilson, Black Rock, Australia, assignor to Spotless Plastics Pty. Ltd., Moorabbin, Australia
Filed May 27, 1987, Ser. No. 54,811
Term of patent 14 years
U.S. Cl. D6—326



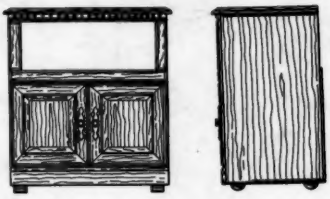




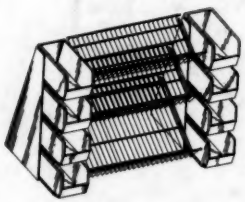
301,662
SWIVEL CHAIR
Robert Vonhausen, Giessen, Fed. Rep. of Germany, assignor to VOKO Franz Vogt & Co., Fed. Rep. of Germany
Filed Jun. 20, 1986, Ser. No. 877,541
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 21MR585
Term of patent 14 years
U.S. Cl. D6—366

301,663
ARMCHAIR
Robert Vonhausen, Giessen, Fed. Rep. of Germany, assignor to VOKO Franz Vogt & Co., Fed. Rep. of Germany
Filed Jun. 20, 1986, Ser. No. 877,542
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 21MR586
Term of patent 14 years
U.S. Cl. D6—372

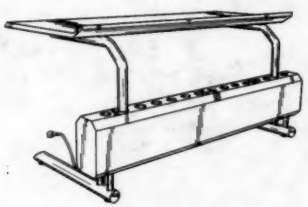
301,664
VIDEO STORAGE CART OR THE LIKE
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed May 2, 1988, Ser. No. 189,689
Term of patent 14 years
U.S. Cl. D6—436



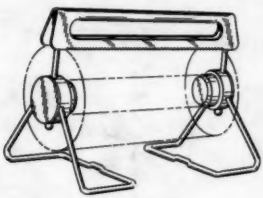
301,665
PASTRY RACK
J. Marshall Suttles, Elberton, Ga., assignor to Royston Corporation, Royston, Ga.
Filed Apr. 21, 1986, Ser. No. 856,135
Term of patent 14 years
U.S. Cl. D6—463



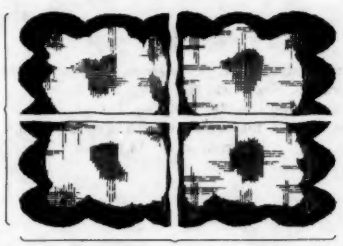
301,666
OFFICE TABLE
Urs Greutmann, and Carmen Bolzern, both of Zurich, Switzerland, assignors to Denz & Co., AG, Zurich, Switzerland
Filed Jan. 6, 1986, Ser. No. 816,191
Claims priority, application Switzerland, Jul. 5, 1985, 114.614
Term of patent 14 years
U.S. Cl. D6—480



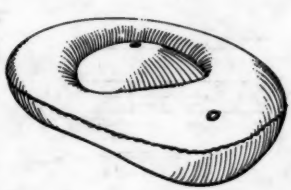
301,667
ROLLED MATERIAL DISPENSER
Amy W. Barrs, Atlanta; Kurtis L. Brown, Woodstock; James F. Dickson, Atlanta, and Stephen M. Englebert, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 2, 1987, Ser. No. 128,538
Term of patent 14 years
U.S. Cl. D6—518



301,668
RUG OR SIMILAR ARTICLE
Park B. Smith, New York, N.Y., assignor to Park B. Smith, Inc., New York, N.Y.
Filed Oct. 27, 1988, Ser. No. 263,137
Term of patent 14 years
U.S. Cl. D6—592

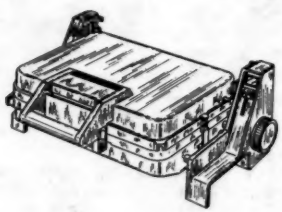


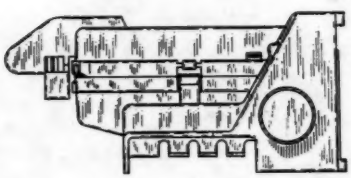
301,669
TWO-CHAMBER INFLATABLE AIR CUSHION
Vernon I. Dwelly, 6 Carmel Dr., Novato, Calif. 94947
Filed Apr. 7, 1986, Ser. No. 850,394
Term of patent 14 years
U.S. Cl. D6—601



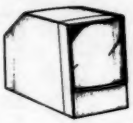
301,670
ROTATABLE WINE AND GLASS RACK
Charles B. Kennedy, 818 Banks Ave., Knoxville, Tenn. 37917
Filed Jan. 24, 1986, Ser. No. 821,960
Term of patent 14 years
U.S. Cl. D7—71

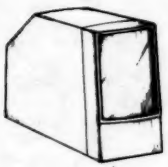
301,671
GRILL
Jan F. Van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 18, 1986, Ser. No. 944,796
Claims priority, application Benelux, Jun. 20, 1986, 61194-00
Term of patent 14 years
U.S. Cl. D7—352





301,672
BEVERAGE DISPENSER VALVE
Alvin H. Schechter, New York, N.Y., and Carl R. Thompson, Stratford, Conn., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Mar. 5, 1986, Ser. No. 841,748
Term of patent 14 years
U.S. Cl. D7—398



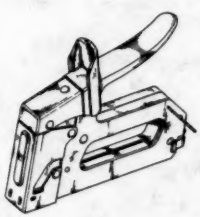


301,673
HEIGHT ADJUSTMENT HANDLE FOR SUSPENDING A GRID ON A BARBEQUE GRILL
Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321
Filed Jul. 2, 1986, Ser. No. 881,461
Term of patent 14 years
U.S. Cl. D7—402

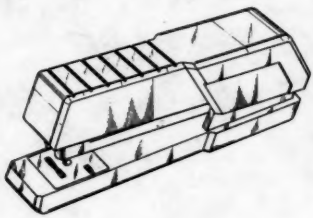
301,674
IMPLEMENT FOR PICKING UP PINE CONES OR THE LIKE
Tim S. Smith, and Zondra Smith, both of 806 Forrest Ave., Eastman, Ga. 31023
Filed Jul. 10, 1986, Ser. No. 884,266
Term of patent 14 years
U.S. Cl. D8—13

301,675
FUSE PULLER
James N. Pearse, Dix Hills, N.Y., and Wolfgang F. Bienwald, Inverness, Fla., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Continuation-in-part of Ser. No. 794,351, Nov. 1, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 909,460
Term of patent 14 years
U.S. Cl. D8—14

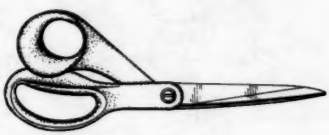
301,676
STAPLING GUN OR SIMILAR ARTICLE
Chi Hui-Neng, No. 32, Kuang Cheng Rd., Twu Cheng Ts'un, Ta Li Hsiang, Taichung Hsien, Taiwan
Filed Jun. 24, 1986, Ser. No. 877,980
Term of patent 14 years
U.S. Cl. D8—49



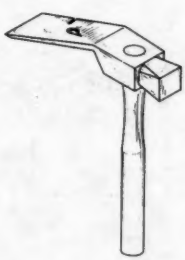
301,677
STAPLER
Lars-Göran Rosenblad, Huskvarna, Sweden, assignor to Isaberg AB, Hestra, Sweden
Filed May 20, 1986, Ser. No. 867,251
Claims priority, application Sweden, Nov. 26, 1985, 85-2862
Term of patent 14 years
U.S. Cl. D8—50



301,678
SCISSORS
Erkki O. Lindén, Björkkulla, Finland, assignor to Fiskars Oy Ab, Helsinki, Finland
Filed Dec. 22, 1986, Ser. No. 946,274
Claims priority, application Finland, Aug. 22, 1986, 818/86
Term of patent 14 years
U.S. Cl. D8—57



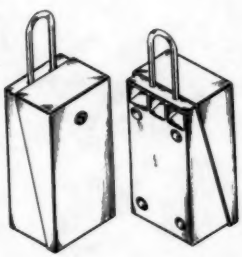
301,679
COMBINED HAMMER AND HATCHET
Nick Kokkinos, 423 N. Pinellas Ave., Tarpon Springs, Fla. 33589
Filed Nov. 18, 1985, Ser. No. 805,369
Term of patent 14 years
U.S. Cl. D8—75



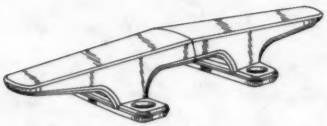
301,680
KNIFE FOR CUTTING PLASTIC CABLE INSULATION
William W. Glaze, 101 Glaze St., Vidalia, Ga. 30474
Filed Apr. 28, 1986, Ser. No. 857,817
Term of patent 14 years
U.S. Cl. D8—98

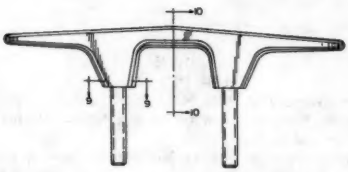
301,681
KNOB
Franz W. Jans, Offenbach am Main, Fed. Rep. of Germany, assignor to Armaturen & Presswerk GmbH, Roedermark, Fed. Rep. of Germany
Filed Jan. 14, 1987, Ser. No. 3,186
Term of patent 14 years
U.S. Cl. D8—312

301,682
LOCKBOX FOR VIDEOTAPES OR THE LIKE
Will H. Gardenswartz, 6255 Habitat Dr., #3022, Boulder, Colo. 80301
Filed Oct. 16, 1987, Ser. No. 109,695
Term of patent 14 years
U.S. Cl. D8—333

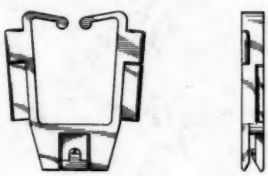


301,683
CLEAT FOR BOATS
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Apr. 21, 1986, Ser. No. 857,417
Term of patent 14 years
U.S. Cl. D8—356

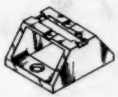




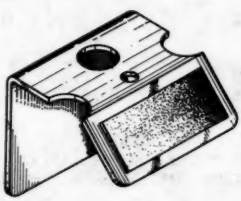
301,684
GROMMET FOR ELECTRICAL WIRES
Richard Herzog, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 25, 1986, Ser. No. 857,779
Term of patent 14 years
U.S. Cl. D8—356

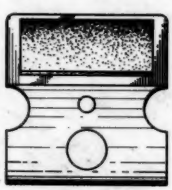


301,685
SECURITY ALARM BRACKET
Dennis L. Vories, Valley Center, Calif., assignor to F. B. Nutter Enterprises, Inc., San Bernardino, Calif.
Filed Mar. 25, 1986, Ser. No. 845,826
Term of patent 14 years
U.S. Cl. D8—373

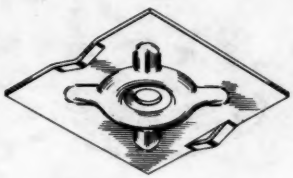


301,686
BRACKET FOR CLOCK, FIGURE TOY OR SIMILAR ARTICLE
Randy L. Long, 100 N. Ohio St., Appleton City, Mo. 64724
Filed Apr. 28, 1986, Ser. No. 857,828
Term of patent 14 years
U.S. Cl. D8—373





301,687
MINE ROOF SUPPORT PLATE
Bruce A. Cassidy, R.D. 1, Box 319, Richmond, Ohio 43944, and James O. Gray, R.D. 1, Rayland, Ohio 43943
Filed Nov. 13, 1985, Ser. No. 805,102
Term of patent 14 years
U.S. Cl. D8—399



301,688
DUAL COMPARTMENT BOTTLE
Richard D. Green, 1150 18th St., Ste. 101, Santa Monica, Calif. 90403
Filed Mar. 21, 1986, Ser. No. 845,412
Term of patent 14 years
U.S. Cl. D9—341

301,689
GAS CONTAINER
Orval L. Fick, and Raymond B. Ferbrache, both of Winfield, Kans., assignors to Gott Corporation, Winfield, Kans.
Filed May 8, 1986, Ser. No. 862,444
Term of patent 14 years
U.S. Cl. D9—374

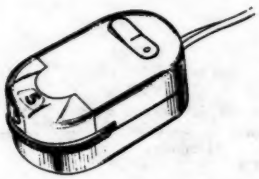
301,690
CONTAINER LID
Laura P. Mobberley, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed May 15, 1986, Ser. No. 863,531
Term of patent 14 years
U.S. Cl. D9—452

301,691
CONTAINER LID
Laura P. Mobberley, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed May 15, 1986, Ser. No. 863,532
Term of patent 14 years
U.S. Cl. D9—453

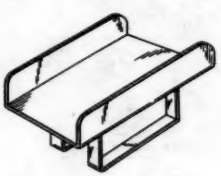
301,692
WRIST WATCH
Masamichi Wakamatsu, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 17, 1986, Ser. No. 887,114
Term of patent 14 years
U.S. Cl. D10—38

301,693
WRIST WATCH
Vittorio Canta, 1260 Rue University, Ste. 304, Montreal, Quebec H3B 3B9, Canada
Filed Apr. 14, 1986, Ser. No. 852,505
Term of patent 14 years
U.S. Cl. D10—39

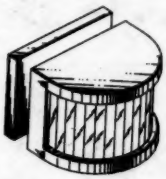
301,694
CONTROL HOUSING FOR AN ELECTRIC BLANKET
Ronald E. Ahlers, Bronxville, and Ronald Emmerling, New York, both of N.Y., assignors to J.C. Penney Co. Inc., Dallas, Tex.
Filed Feb. 25, 1986, Ser. No. 836,447
Term of patent 14 years
U.S. Cl. D10—50



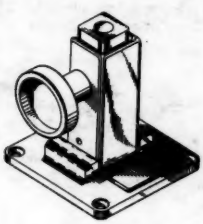
301,695
PATIENT WEIGHT BASKET
Fernando V. DeCastro, 6125 Clayton Ave., Ste. 130, St. Louis, Mo. 63139
Filed Feb. 10, 1986, Ser. No. 827,729
Term of patent 14 years
U.S. Cl. D10—94



301,696
INFRARED RADIATION DETECTOR
Hugh T. Greenlee, and Roy P. Hess, both of Cuyahoga County, Ohio, assignors to Burle Technologies, Inc., Lancaster, Pa.
Filed Apr. 4, 1986, Ser. No. 850,339
Term of patent 14 years
U.S. Cl. D10—106



301,697
ADJUSTABLE HOLDER FOR WATER SKIING SAFETY FLAG
Gary F. Morris, 2169 St. Mary's Dr., Salt Lake City, Utah 84108
Filed Jan. 5, 1987, Ser. No. 964
Term of patent 14 years
U.S. Cl. D10—121

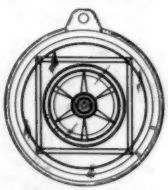


301,698
ROPE CHAIN
Jacob Markovits, 1313 53rd St., Brooklyn, N.Y. 11219
Filed May 8, 1986, Ser. No. 862,399
Term of patent 14 years
U.S. Cl. D11—13

301,699
ROSE CHAIN
Jacob Markovits, 1313 53rd St., Brooklyn, N.Y. 11219
Filed May 21, 1986, Ser. No. 867,283
Term of patent 14 years
U.S. Cl. D11—13

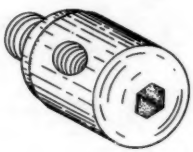
301,700
EARDROP HOLDER
Brenda D. Coleman, 6615 Calmos St., Peppermill Village, Md. 20743
Filed Jun. 11, 1986, Ser. No. 873,317
Term of patent 14 years
U.S. Cl. D11—86

301,701
MEDALLION
Hubert Palm, Linzgaublick 2, 7750 Konstanz 19 - Wallhausen, Fed. Rep. of Germany
Filed Apr. 6, 1988, Ser. No. 178,286
Term of patent 14 years
U.S. Cl. D11—96

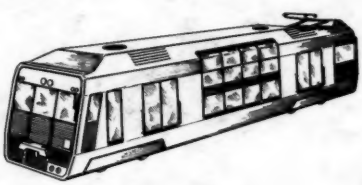


301,702
BELT BUCKLE
Donald G. Peterson, 0361 County Rd. 1040, Frisco, Colo. 81401
Filed Dec. 1, 1986, Ser. No. 937,131
Term of patent 14 years
U.S. Cl. D11—230

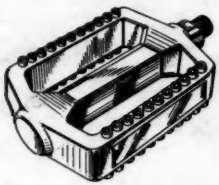
301,703
MOTORCYCLE OIL GAUGE FITTING
Michael Bernstein, 7950 Curtis Blvd., Falcon, Colo. 80831
Filed Sep. 28, 1987, Ser. No. 101,960
Term of patent 14 years
U.S. Cl. D12—114



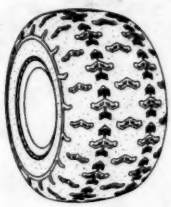
301,704
RAIL CAR
Michael Groves; Anthony Hume; Jonathan Sothcott, all of Warwick, England, and Martin Pemberton, Sydney, Australia, assignors to State Rail Authority of New South Wales, Australia
Filed Apr. 24, 1986, Ser. No. 857,604
Claims priority, application Australia, Oct. 25, 1985, 3067/85
Term of patent 14 years
U.S. Cl. D12—40



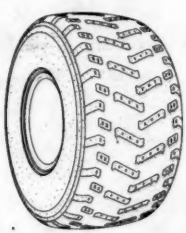
301,705
CYCLE PEDAL
William H. Ropp, Centerville, Ohio, assignor to Huffy Corporation, Miamisburg, Ohio
Filed Jan. 16, 1987, Ser. No. 5,530
Term of patent 14 years
U.S. Cl. D12—125



301,706
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 15, 1986, Ser. No. 896,974
Claims priority, application Japan, May 28, 1986, 61-20745
Term of patent 14 years
U.S. Cl. D12—136



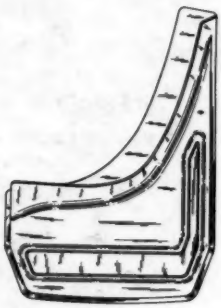
301,707
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 1, 1986, Ser. No. 880,904
Claims priority, application Japan, Mar. 19, 1986, 61-10198
Term of patent 14 years
U.S. Cl. D12—147



301,708
MOTORCYCLE TIRE
Shigehiko Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 18, 1986, Ser. No. 897,206
Claims priority, application Japan, Jun. 19, 1986, 61-23563
Term of patent 14 years
U.S. Cl. D12—147

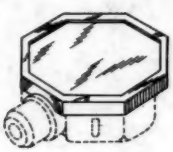
301,709
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 17, 1986, Ser. No. 908,525
Claims priority, application Japan, Jun. 6, 1986, 61-22031
Term of patent 14 years
U.S. Cl. D12—149

301,710
VEHICLE SPLASH GUARD
Douglas K. Ward, and Jerry N. Moscovitch, both of Toronto, Canada, assignors to Powerflow Products, Ltd., Toronto, Canada
Filed May 30, 1986, Ser. No. 869,029
Term of patent 14 years
U.S. Cl. D12—185

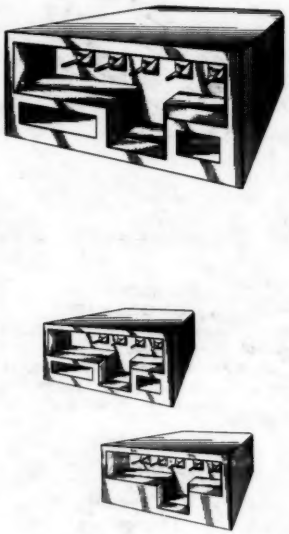


301,711
BOAT
Michael Allbritton, Longview, Tex., assignor to Skeeter Products, Inc., Kilgore, Tex.
Filed Aug. 8, 1988, Ser. No. 229,351
Term of patent 14 years
U.S. Cl. D12—314

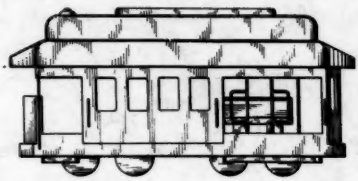
301,712
ELECTRICAL CONNECTOR FOR A MERCHANDISE SECURITY SYSTEM
Marcia Israel, 7710 Haskell Ave., Van Nuys, Calif. 91406
Filed Sep. 2, 1986, Ser. No. 903,067
Term of patent 14 years
U.S. Cl. D13—24

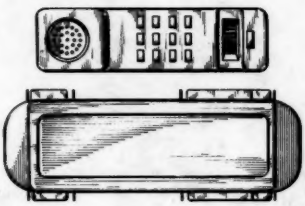


301,713
PORTABLE MEMORY MODULE
Michael L. Bolan; Francis A. Scherpenberg, and William F. Davies, Jr., all of Dallas, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.
Filed Oct. 30, 1985, Ser. No. 792,961
Term of patent 14 years
U.S. Cl. D14—114



301,714
TELEPHONE SET
Kash Gobindram, Farmingdale, N.Y., assignor to Kash 'N' Gold Ltd., Ronkonkoma, N.Y.
Filed Apr. 9, 1987, Ser. No. 36,247
Term of patent 14 years
U.S. Cl. D14—143

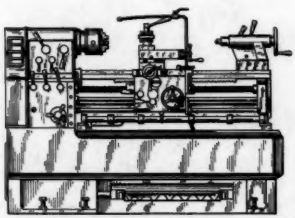


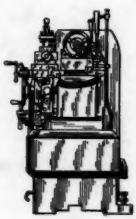


301,715
RADIO RECEIVER
Murray I. C. Camens, Den Bosch, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 9, 1986, Ser. No. 916,989
Claims priority, application United Kingdom, Apr. 16, 1986, 1033510
Term of patent 14 years
U.S. Cl. D14—192

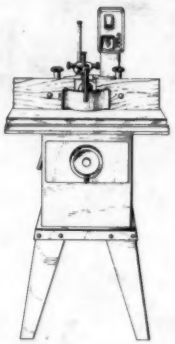
301,716
PORTABLE RADIO RECEIVER
Itsumi Ohzu, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jun. 5, 1986, Ser. No. 871,578
Term of patent 14 years
U.S. Cl. D14—188

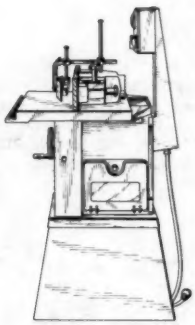
301,717
PRECISION LATHE
Cheng-Chwen Huang, Dah-Li, Taiwan, assignor to Shenjey Industrial Co., Ltd., Taichung, Taiwan
Filed Mar. 15, 1985, Ser. No. 712,083
Term of patent 14 years
U.S. Cl. D15—130



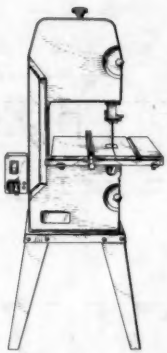


301,718
POWER-DRIVEN MILLING MACHINE
Marc Wodli, 6 rue Poincare, 67800 Bischheim, France
Filed Sep. 4, 1987, Ser. No. 93,892
Term of patent 14 years
U.S. Cl. D15—131



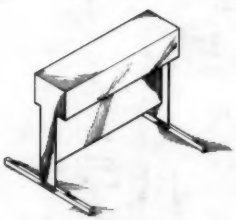


301,719
POWER-DRIVEN BAND SAW
Marc Wodli, 6 rue Poincare, 67800 Bischheim, France
Filed Sep. 4, 1987, Ser. No. 93,891
Term of patent 14 years
U.S. Cl. D15—134

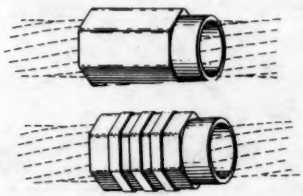


301,720
BOOKEND
Joseph V. Percoco, 6746 S. Bellaire Way, Littleton, Colo. 80122, and Richard Percoco, 6400 Ester Blvd. #503, Ft. Myer Beach, Fla. 33931
Filed Feb. 19, 1985, Ser. No. 702,785
Term of patent 14 years
U.S. Cl. D19—34.1

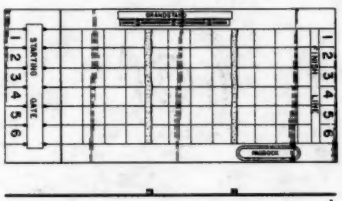
301,721
PORTABLE DISPLAY SIGN
Larry O. Myshyniuk, 950 SW. 15th Ave., Delray Beach, Fla. 33444
Filed Feb. 5, 1986, Ser. No. 826,213
Term of patent 14 years
U.S. Cl. D20—10



301,722
CABLE IDENTIFICATION SLEEVE
Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval Que., Canada H7W 1L3
Filed Mar. 8, 1985, Ser. No. 709,726
Term of patent 14 years
U.S. Cl. D20—22



301,723
GAME BOARD
Anthony J. Nardello, Mantua, N.J., assignor to Anthony J. Nardello, Mantau, N.J. and Thomas D. Rabbittino, Philadelphia, Pa.
Filed Jan. 31, 1986, Ser. No. 825,047
Term of patent 14 years
U.S. Cl. D21—27

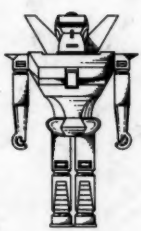


301,724
SIMULATIVE RIDING TOY
David B. Tohl, 10705 Hepburn Cir., Culver City, Calif.
Filed Aug. 4, 1987, Ser. No. 81,883
Term of patent 14 years
U.S. Cl. D21—74

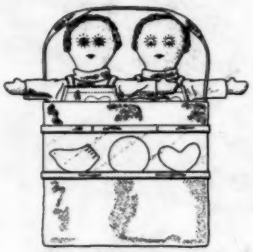
301,725
TOY BADGER ANIMAL FIGURE
Ken Havelock, 1401 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed May 27, 1986, Ser. No. 879,553
Term of patent 14 years
U.S. Cl. D21—148

301,726
NOVELTY TOOTH FIGURE
John M. Williams, 6703 Saffron Hills, Spring, Tex. 77379
Filed Apr. 27, 1988, Ser. No. 197,899
Term of patent 14 years
U.S. Cl. D21—155

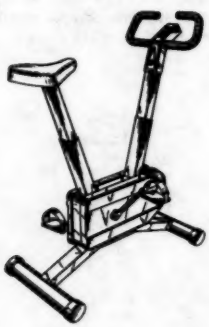
301,727
TOY ROBOT
David C. Brune, Rte. 1, Box 593B, Cedar Hill, Mo. 63016
Filed Feb. 18, 1986, Ser. No. 834,050
Term of patent 14 years
U.S. Cl. D21—166



301,728
COMBINED DOLLS AND CARRIER
Mary C. Garner, 3112 O St., NW., Washington, D.C. 20007
Filed Aug. 19, 1988, Ser. No. 234,281
Term of patent 14 years
U.S. Cl. D21—167



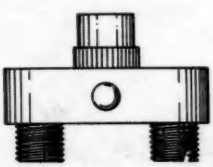
301,729
ERGOMETER
Jan Capjon, Fagerstrand, Norway, assignor to J. Oglaend, Inc., Mt. Kisco, N.Y.
Filed Dec. 19, 1986, Ser. No. 944,888
Term of patent 14 years
U.S. Cl. D21—194



301,730
WEIGHTED FISHING WORM
Donnie Morris, Rte. 10, Box 609, Fort Worth, Tex. 76135
Filed Mar. 3, 1987, Ser. No. 21,012
Term of patent 14 years
U.S. Cl. D22—127

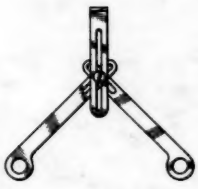
301,731
HYDRO-THERAPY FITTING
David W. Allen, Garden Grove, and David K. Kramer, Fullerton, both of Calif., assignors to Honiton Investments, N.V., Curacao, Netherlands Antilles
Filed Mar. 17, 1986, Ser. No. 845,017
Term of patent 14 years
U.S. Cl. D23—213

301,732
FLUID DISTRIBUTION MANIFOLD
Joanna Malagrida, 2189 Alpena Ave., Dayton, Ohio 45406
Filed Jan. 23, 1986, Ser. No. 821,780
Term of patent 14 years
U.S. Cl. D23—263

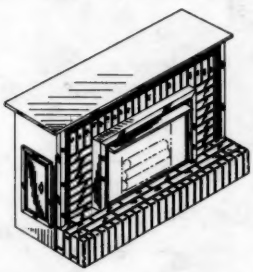


301,733
MICROWAVE-POWERED WATER HEATER
Bentley Mansfield, 1907 S. Fannin St., Amarillo, Tex. 79109
Filed Oct. 7, 1986, Ser. No. 916,461
Term of patent 14 years
U.S. Cl. D23—318

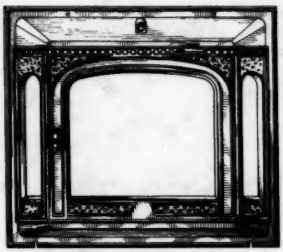
301,734
STRAP FOR SECURING A SEISMIC WATER HEATER
Richard J. Pernosky, 621 S. East St., Anaheim, Calif. 92805
Filed Sep. 15, 1986, Ser. No. 907,531
Term of patent 14 years
U.S. Cl. D23—322



301,735
CABINET FOR A FIREPLACE SIMULATION BURNER UNIT
Wayne E. Meyers, Chicago, Ill., assignor to Raphael Investments, Batavia, Ill.
Filed Jul. 23, 1987, Ser. No. 76,743
Term of patent 14 years
U.S. Cl. D23—345

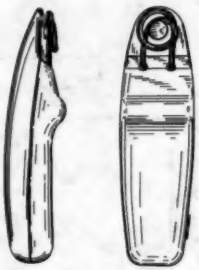


301,736
FRONT PANEL FOR A FIREPLACE
Niels E. Heger, Jessheim, Norway, assignor to A/S Jotul, Oslo, Norway
Filed Aug. 7, 1987, Ser. No. 82,724
Claims priority, application Norway, Feb. 10, 1987, 68042
Term of patent 14 years
U.S. Cl. D23—404

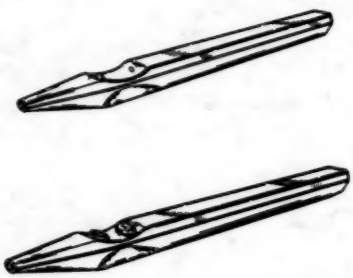


301,737
MICROBIOLOGICAL CULTURE
John H. Powers, Silver Springs, Md., assignor to BioClinical Systems, Inc., Columbia, Md.
Filed May 7, 1986, Ser. No. 860,780
Term of patent 14 years
U.S. Cl. D24—8

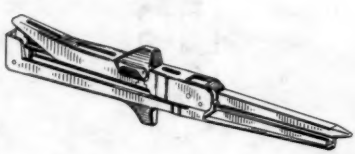
301,738
DEPILATOR
Yair Daar, Moshav Galia, and Shimon Yahav, 16 Remez Street, Rehovot, both of Israel
Filed Aug. 15, 1986, Ser. No. 897,108
Term of patent 14 years
U.S. Cl. D24—26



301,739
ELECTROSURGICAL PENCIL
Alexander Turner, Ithaca; Bradley W. Lewis, Spencer; Egidio L. De Oliveira, and John R. Scoville, both of Monroe, all of N.Y., assignors to MDT Corporation, Torrance, Calif.
Filed Oct. 15, 1986, Ser. No. 924,082
Term of patent 14 years
U.S. Cl. D24—26

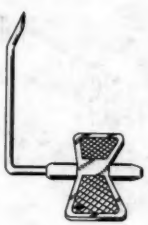


301,740
SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Dec. 22, 1986, Ser. No. 944,884
Term of patent 14 years
U.S. Cl. D24—27

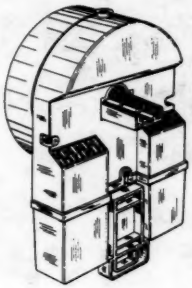


301,741
BABY BOTTLE
Michael G. Barber, 6707 S. 112th East Ave., Tulsa, Okla. 74133
Filed May 8, 1987, Ser. No. 47,065
Term of patent 14 years
U.S. Cl. D24—47

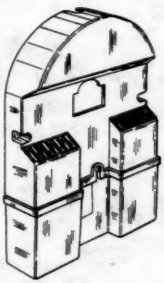
301,742
WINGED ANGULAR INFUSION NEEDLE
Mark Wyzgala, Mercer Island, Wash., and Thomas E. Morizio, Highland Park, Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed Mar. 18, 1986, Ser. No. 841,079
Term of patent 14 years
U.S. Cl. D24—52



301,743
DRIVE UNIT FOR ROLLING DOOR
Paul M. Schremmer, Hunters Hill, Australia, assignor to Byrne & Davidson Doors (N.S.W.) Pty. Limited, Revesby, Australia
Filed Oct. 15, 1986, Ser. No. 919,333
Claims priority, application Australia, Apr. 15, 1986, 4884/86
Term of patent 14 years
U.S. Cl. D25—49



301,744
COMBINED COVER UNIT AND LAMP HOUSING FOR A ROLLING DOOR
Paul M. Schremmer, Hunters Hill, Australia, assignor to Bryne & Davidson Doors (N.S.W.) Pty. Limited, Revesby, Australia
Filed Oct. 15, 1986, Ser. No. 919,334
Claims priority, application Australia, Apr. 15, 1986, 4880/86
Term of patent 14 years
U.S. Cl. D25—49

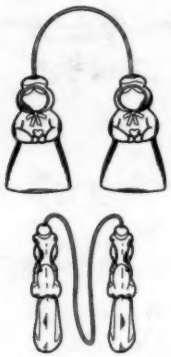


301,745
WALLBOARD CEILING RUNNER
Lowell Burkstrand, Rte. 1, Box 170, Braham, Minn. 55006, and George Burkstrand, 4335 4th St., Columbia Heights, Minn. 55421
Filed Oct. 31, 1986, Ser. No. 925,664
Term of patent 14 years
U.S. Cl. D25—119

301,746
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P.H. Tech Inc., Levis, Canada
Filed Feb. 3, 1987, Ser. No. 10,565
Claims priority, application United Kingdom, Aug. 8, 1986, 1,035,965
Term of patent 14 years
U.S. Cl. D25—122

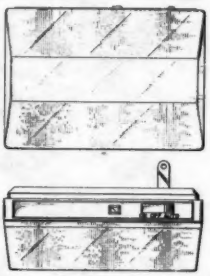
301,747
PAIR OF LINKED CANDLES
Michael C. B. Lam, Ground Floor, Kwai Bo Industrial Building, 40 Wong Chuk Hang Road, Aberdeen, Hong Kong
Filed Aug. 28, 1986, Ser. No. 901,475
Term of patent 14 years
U.S. Cl. D26—7

301,748
PAIR OF LINKED CANDLES
Michael C. B. Lam, Ground Floor, Kwai Bo Industrial Building, 40 Wong Chuk Hang Road, Aberdeen, Hong Kong
Filed Aug. 28, 1986, Ser. No. 901,478
Term of patent 14 years
U.S. Cl. D26—7

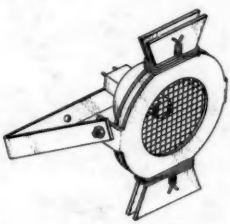


301,749
LIQUID CANDLE
Todd M. Comstock, Cotuit, Mass., assignor to Renoir Candles, Ltd., Norfolk, Mass.
Division of Ser. No. 604,896, Apr. 27, 1984, Pat. No. 4,608,011.
This application Jul. 16, 1986, Ser. No. 885,850
Term of patent 14 years
U.S. Cl. D26—9

301,750
NIGHTLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Jun. 9, 1986, Ser. No. 872,462
Term of patent 14 years
U.S. Cl. D26—26



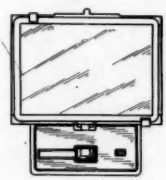
301,751
LIGHT FIXTURE
Robert J. Gaul, New York, N.Y., assignor to Archetype Gallery, Inc., New York, N.Y.
Filed Dec. 9, 1986, Ser. No. 939,762
Term of patent 14 years
U.S. Cl. D26—37

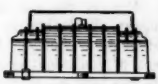


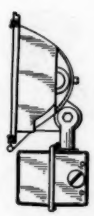
301,752
SPOTLIGHT
Ralph F. Osterhout, San Francisco, Calif., assignor to Tekna, Redwood City, Calif.
Filed Apr. 2, 1986, Ser. No. 847,614
Term of patent 14 years
U.S. Cl. D26—45

301,753
COMBINED BATTERY POWERED LIGHT AND UNIVERSAL SPRING ACTION CLIP
Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.
Filed Dec. 5, 1986, Ser. No. 938,757
Term of patent 14 years
U.S. Cl. D26—60

301,754
COMBINED OUTDOOR FLOODLIGHT AND PHOTO ELECTRIC CONTROL THEREFOR
Giovanni DeCandia, Germantown, Tenn., assignor to FL Industries, Inc., Livingston, N.J.
Filed May 22, 1986, Ser. No. 866,094
Term of patent 14 years
U.S. Cl. D26—63

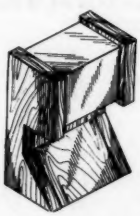






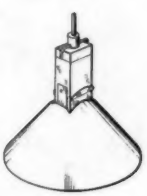
301,755
ADJUSTABLE LAMP
Ernesto Gismondi, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Jan. 20, 1987, Ser. No. 5,526
Claims priority, application Italy, Jul. 23, 1986, 22610 B/86[U]
Term of patent 14 years
U.S. Cl. D26—63

301,756
FREE-STANDING DECK LIGHT
Mark L. Hanson, Golden Valley, Minn., assignor to MinnFac, Inc., Minneapolis, Minn.
Filed Apr. 3, 1987, Ser. No. 33,607
Term of patent 14 years
U.S. Cl. D26—68



301,757
BOLT ON DECK LIGHT
Mark L. Hanson, Golden Valley, Minn., assignor to MinnFac, Inc., Minneapolis, Minn.
Filed Apr. 3, 1987, Ser. No. 33,608
Term of patent 14 years
U.S. Cl. D26—68

301,758
CEILING LAMP
Richard F. Sapper, Stuttgart, Fed. Rep. of Germany, assignor to Artemide S.P.A., Pregnana Milanese, Italy
Filed Jul. 8, 1986, Ser. No. 883,810
Claims priority, application Italy, Jan. 16, 1986, 20506 B/86[U]
Term of patent 14 years
U.S. Cl. D26—85

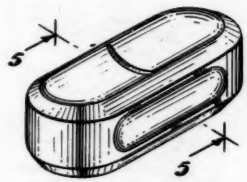


301,759
STANDING LAMP
Carlo Forcolini, Milan, Italy, assignor to Artemide S.P.A., Milan, Italy
Filed Jan. 20, 1987, Ser. No. 5,523
Claims priority, application Italy, Jul. 23, 1986, 22607 B/86
Term of patent 14 years
U.S. Cl. D26—106

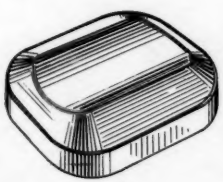
301,760
COMBINED LIGHT BULB ATTACHMENT AND SCENT RELEASING PEBBLES THEREFOR
Annick Goutal, Paris, France, assignor to Annick Goutal (a limited liability company), Paris, France
Filed Jul. 31, 1987, Ser. No. 82,425
The portion of the term of this patent subsequent to Jun. 13, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—113

301,761
LIGHTER THUMBROLLER
Jean G. Malamoud, Saint Jorioz, France, assignor to S. T. Dupont, Paris Cedex, France
Filed May 14, 1985, Ser. No. 733,814
Claims priority, application France, Nov. 29, 1984, 845 315
Term of patent 14 years
U.S. Cl. D27—161

301,762
TABLET
Benjamin Oshlack, New York, N.Y., assignor to Euroceltique S.A., Luxembourg, Luxembourg
Filed Jul. 14, 1986, Ser. No. 885,037
Term of patent 14 years
U.S. Cl. D28—2



301,763
PHARMACEUTICAL TABLET
Gregory A. Rhoa, Collegeville, and Pravinchandra B. Shah, Warminster, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Nov. 16, 1987, Ser. No. 121,772
Term of patent 14 years
U.S. Cl. D28—2



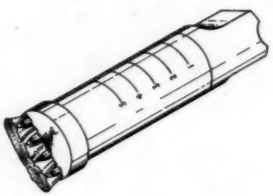
301,764
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grimm, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 21, 1987, Ser. No. 136,156
Term of patent 14 years
U.S. Cl. D28—2

301,765
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 21, 1987, Ser. No. 136,157
Term of patent 14 years
U.S. Cl. D28—2

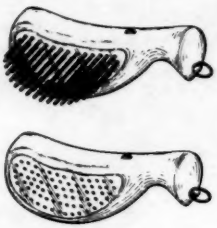
301,766
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 28, 1987, Ser. No. 138,884
Term of patent 14 years
U.S. Cl. D28—2

301,767
APPLICATOR FOR APPLYING CREAM FOR BALDNESS
James B. DeYarman, 990 Highland Rd., #310, Solana Beach, Calif. 92075
Filed May 29, 1986, Ser. No. 868,348
Term of patent 14 years
U.S. Cl. D28—7

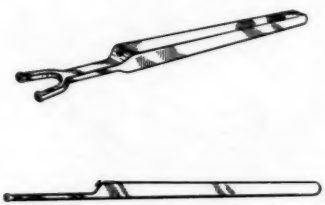
301,768
COMBINED CONTAINER AND APPLICATOR FOR HAIR TINT
Juanita Herndon, 8241 S. Marshfield St., Chicago, Ill. 60620
Filed Oct. 7, 1986, Ser. No. 916,458
Term of patent 14 years
U.S. Cl. D28—20



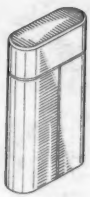
301,769
RETRACTABLE COMB
Fargo Chou, P.O. Box 10160, Taipei, Taiwan
Filed Oct. 2, 1986, Ser. No. 914,753
Term of patent 14 years
U.S. Cl. D28—21

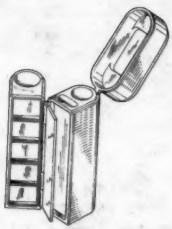


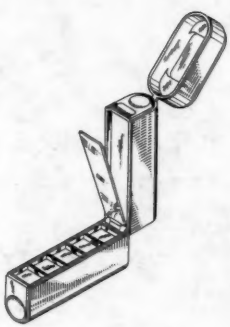
301,770
DENTAL FLOSS HOLDER
Elizabeth A. Bethany, 203 Casa Urbano, Clinton, Miss. 39056
Filed Jul. 1, 1986, Ser. No. 880,906
Term of patent 14 years
U.S. Cl. D28—64



301,771
COSMETIC CASE
Karena Bakic, Munich, Fed. Rep. of Germany, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed May 21, 1986, Ser. No. 866,688
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, URA 1445/85
Term of patent 14 years
U.S. Cl. D28—76



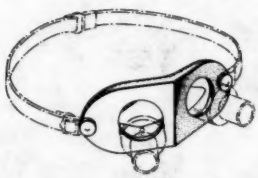




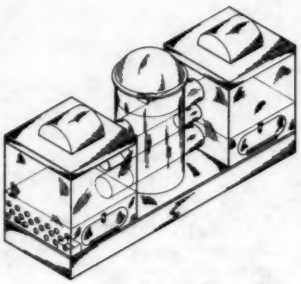
301,772
LIPSTICK CASE
Karen E. McCready, New City, N.Y., assignor to Elleance Ltd., New City, N.Y.
Filed Feb. 9, 1987, Ser. No. 12,783
Term of patent 14 years
U.S. Cl. D28—85

301,773
ATOMIZER
Yukio Murakami, and Noboru Hara, both of Hiroshima, Japan, assignors to Fumakilla Limited, Tokyo, Japan
Filed Jan. 30, 1986, Ser. No. 825,676
Claims priority, application Japan, Jul. 30, 1985, 60-32247
Term of patent 14 years
U.S. Cl. D28—91.1

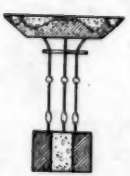
301,774
RESPIRATORY MASK
Kevin A. Rudolph, Leawood, Kans., and Donald C. Zavala, Iowa City, Iowa, assignors to Hans Rudolph, Inc., Kansas City, Mo.
Filed May 18, 1987, Ser. No. 51,124
Term of patent 14 years
U.S. Cl. D29—7



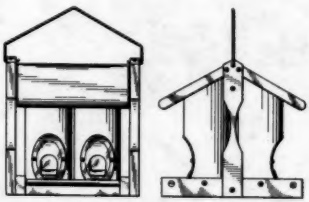
301,775
COMBINED TERRARIUM AND AQUARIUM
Michael D. McKeever, 1808 Sunset Pt. Rd., Apt. K, Clearwater, Fla. 33575
Filed Aug. 4, 1986, Ser. No. 892,775
Term of patent 14 years
U.S. Cl. D30—104



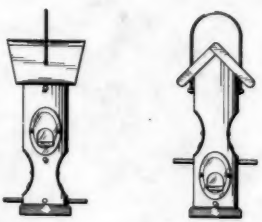
301,776
COMBINED BIRD BATH AND PLANTER
Vernon Ochs, 3416 West 12th St., Apt. #1, Little Rock, Ark. 72204
Filed Feb. 13, 1987, Ser. No. 14,649
Term of patent 14 years
U.S. Cl. D30—123



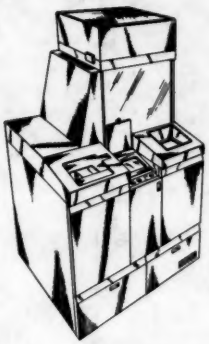
301,777
BIRD FEEDER
Victor Fasino, 62 Oneida Ave., Landing, N.J. 07850
Filed Jul. 24, 1987, Ser. No. 77,775
Term of patent 14 years
U.S. Cl. D30—126



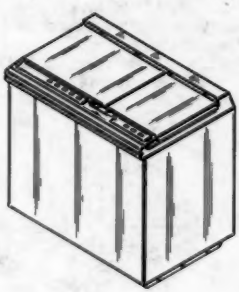
301,778
BIRD FEEDER
Victor Fasino, 62 Oneida Ave., Landing, N.J. 07850
Filed Jul. 24, 1987, Ser. No. 77,776
Term of patent 14 years
U.S. Cl. D30—127



301,779
ACOUSTICAL CLEANING SYSTEM
Brian A. Giles, Honeoye Falls, and Frederick J. Schwab, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 16, 1986, Ser. No. 864,914
Term of patent 14 years
U.S. Cl. D32—1



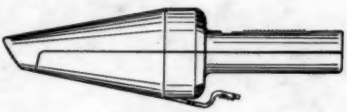
301,780
COMBINED CLOTHES WASHER AND DRIER
Akira Ezaki; Tazuo Orihara, and Kiminori Yamaguchi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 24, 1987, Ser. No. 42,094
Claims priority, application Japan, Oct. 27, 1986, 61-42737
Term of patent 14 years
U.S. Cl. D32—5



301,781
WASHING MACHINE
Antonio G. Bover, Barcelona, Spain, assignor to Girbau, S.A., Spain
Filed May 2, 1986, Ser. No. 859,261
Term of patent 14 years
U.S. Cl. D32—6

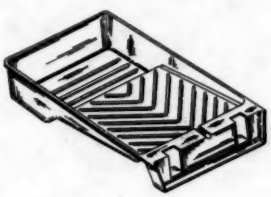
301,782
WASHING MACHINE
Antonio G. Bover, Barcelona, Spain, assignor to Girbau, S.A., Spain
Filed May 9, 1986, Ser. No. 862,417
Claims priority, application Spain, Dec. 20, 1985, 109662
Term of patent 14 years
U.S. Cl. D32—6

301,783
VACUUM CLEANER
Duane D. Adams, Deep River, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 19, 1985, Ser. No. 810,801
Term of patent 14 years
U.S. Cl. D32—18

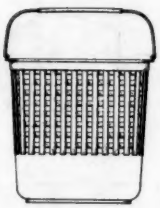


301,784
VACUUM CLEANER
Salvatore Petralia, Sayreville, and H. Gerald Young, South Plainfield, both of N.J., assignors to The Regina Company, Inc., Rahway, N.J.
Filed Feb. 19, 1986, Ser. No. 836,468
Term of patent 14 years
U.S. Cl. D32—22

301,785
PAINT TRAY
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Mar. 23, 1987, Ser. No. 29,425
Term of patent 14 years
U.S. Cl. D32—53.1



301,786
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Apr. 22, 1986, Ser. No. 857,429
Claims priority, application Japan, Nov. 21, 1985, 60-48807
The portion of the term of this patent subsequent to Jun. 20, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—1



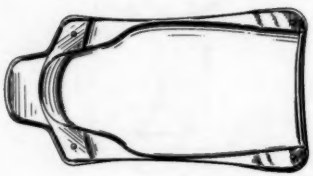
301,787
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Apr. 22, 1986, Ser. No. 857,433
Claims priority, application Japan, Nov. 15, 1985, 60-48072
Term of patent 14 years
U.S. Cl. D34—1

301,788
TRASH BAG CART
Howard F. Werner, 1201 W. Verdugo Ave., Apt. F, Burbank, Calif. 91506
Filed Mar. 17, 1987, Ser. No. 26,654
Term of patent 14 years
U.S. Cl. D34—5

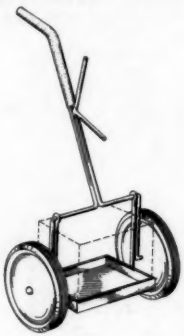
301,789
GOLF CART
Kinzo Tomoda, 3-4-8 Shirogane, Minato-Ku, Tokyo, Japan
Filed Mar. 4, 1987, Ser. No. 21,433
Term of patent 14 years
U.S. Cl. D34—15

301,790
SERVING CART
Morandi Ivano, Vacallo, Switzerland, assignor to Metaltex Italia S.p.A., Como, Italy
Filed Jun. 12, 1987, Ser. No. 62,197
Claims priority, application Italy, Dec. 15, 1986, 24032/86[U]
Term of patent 14 years
U.S. Cl. D34—21

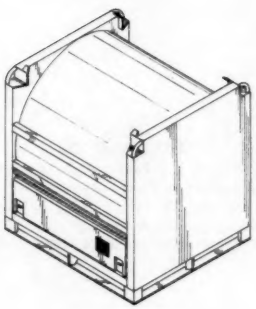
301,791
MECHANIC'S CREEPER
Bryce D. Osborne, 1581 Monrovia Ave., Newport Beach, Calif. 92663
Filed Apr. 27, 1987, Ser. No. 42,658
Term of patent 14 years
U.S. Cl. D34—23



301,792
STORAGE BATTERY CART
Allen R. Knauer, 11375 N. 114th Dr., Youngtown, Ariz. 85363
Filed Nov. 21, 1986, Ser. No. 933,591
Term of patent 14 years
U.S. Cl. D34—26



301,793
CONTAINER FOR TRANSPORTATION OF CRYOGENIC GASES
Torgny Wingbro, Hisings Backa, and Leif Bergstrom, Gothenburg, both of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden
Filed Feb. 7, 1986, Ser. No. 827,044
Term of patent 14 years
U.S. Cl. D34—93



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JUNE, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aasta Pharma AG: *See—*
Engel, Jurgen; and Scheffler, Gerhard, 4,841,047, Cl. 540-599.000.

AB Volvo Penta: *See—*
Brandt, Lennart H., 4,840,136, Cl. 440-78.000.

Abbott Laboratories: *See—*
Larkin, Mark E.; and Ogden, John E., 4,840,621, Cl. 604-29.000.

Abbott, Martyn S., to Quest Medical, Inc. Infusion pump with direct pressure sensing. 4,840,542, Cl. 417-9.000.

Abbott, Richard E.: *See—*
Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., 4,840,894, Cl. 435-7.000.

Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, to Fuji Photo Film Co., Ltd. Silver halide color photographic material and method for processing the same. 4,840,877, Cl. 430-350.000.

Abe, Kazuaki: *See—*
Tsubouchi, Toshiyuki; Abe, Kazuaki; and Hata, Hitoshi, 4,840,745, Cl. 252-73.000.

Abe, Kumiko: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,840,805, Cl. 426-129.000.

Abe, Morio: *See—*
Ejima, Shozo; Sugihara, Taizo; and Abe, Morio, 4,840,846, Cl. 428-373.000.

Abe, Takao: *See—*
Koshizuka, Kunihiro; and Abe, Takao, 4,840,848, Cl. 428-413.000.

Abel, Roy P.; and Welcome, Warren W., to Abel, Roy P. Vehicle low speed warning system. 4,841,276, Cl. 340-466.000.

Action Technologies, Inc.: *See—*
Schumacher, John E., III, 4,840,702, Cl. 156-643.000.

Adachi, Atsushi: *See—*
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.

Adachi, Takeshi; and Masaki, Kazuo, to Yamaha Corporation. Tone signal generation device for an electric musical instrument. 4,840,100, Cl. 84-1.190.

Adams, Craig W.; Leary, Jeffry J.; and Rosenberg, Martin, to Smithkline Beckman Corporation. Polynucleotide hybridization probes. 4,840,892, Cl. 435-5.000.

Adams, George W.; Smock, Steven W.; and Helft, Ross G., to Emhart Industries, Inc. Appliance timer. 4,841,496, Cl. 368-107.000.

Adata Software Limited: *See—*
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

ADC Telecommunications, Inc.: *See—*
Burroughs, Dennis M.; and Cruise, Thomas W., 4,840,568, Cl. 439-49.000.

Addicks, Lyle F. Earthquake illuminating device. 4,841,288, Cl. 340-690.000.

Adell, Robert. Electric toy train track. 4,841,104, Cl. 191-29.00R.

Adger Kogyo Co., Ltd.: *See—*
Iijima, Zenshiro, 4,840,833, Cl. 428-207.000.

Adnyana, Dewa N.; and Rogen, Neil E., to Memory Metals, Inc. Apparatus for sealing a well blowout. 4,840,346, Cl. 251-1.300.

Adrian, Gerhard: *See—*
Gawol, Manfred; and Adrian, Gerhard, 4,840,668, Cl. 106-14.210.

Advanced Micro Devices, Inc.: *See—*
Walters, Donald M., Jr., 4,841,279, Cl. 340-146.200.

Aeschlimann, Peter; and Schwander, Hansrudolf. Reactive dyes comprising a reactive radical bonded to the chromophor by a urea bridge member. 4,841,028, Cl. 534-629.000.

AGA A.B.: *See—*
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., 4,840,656, Cl. 65-85.000.

Agfa - Gevaert Aktiengesellschaft: *See—*
Birgmeir, Klaus, 4,841,360, Cl. 358-80.000.
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.
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Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.
Peters, Manfred; Helling, Gunter; and Reiff, Helmut, 4,840,885, Cl. 430-559.000.

Aglietto, Mauro: *See—*
Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, 4,840,994, Cl. 525-72.000.

Agro-Kanesho Co., Ltd.: *See—*
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.

Ahmad, Eddress: *See—*
Pack, Roger N.; and Ahmad, Eddress, 4,839,972, Cl. 36-117.000.

Aida, Akira; and Ikeda, Toshihiro, to Nippon Seiko Kabushiki Kaisha. Hydraulic lash adjuster. 4,840,153, Cl. 123-90.550.

Air Liquid: *See—*
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.

Air Products and Chemicals, Inc.: *See—*
Zabrenski, John S., 4,840,195, Cl. 137-312.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,840,544, Cl. 417-254.000.

Aisin-Warner Kabushiki Kaisha: *See—*
Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, 4,840,092, Cl. 74-869.000.
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Aiuchi, Susumu: *See—*
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akaba, Noriyuki: *See—*
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Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, to Sanden Corporation. Automotive air conditioning system damper position control. 4,840,308, Cl. 236-13.000.

Akahane, Kenji: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.

Akahori, Kimihiko: *See—*
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Akedo, Jun: *See—*
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.
Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, 4,841,129, Cl. 235-472.000.

Akimoto, Taizo: *See—*
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Akiyama, Akihiko: *See—*
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.

Akiyama, Hideki; and Morita, Toyoo, to Yoshida Kogyo K. K. Slider handling apparatus. 4,839,963, Cl. 29-766.000.

Akiyama, Toru, to Pioneer Electronic Corporation. Time-base error correction apparatus for video tape or disk player. 4,841,379, Cl. 358-337.000.

Akzo N.V.: *See—*
Brodowski, Walter, 4,841,014, Cl. 528-191.000.
Groenenboom, Cornelis J.; and Wieringa, Peter A., 4,840,724, Cl. 208-120.000.
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.
Van Dedem, Gijsbert W. K.; and Van Houdenhoven, Francois E. A., 4,840,897, Cl. 435-69.000.

Alaki, Yasuhide: *See—*
Ihara, Keisuke; Alaki, Yasuhide; and Nomura, Jun, 4,840,381, Cl. 273-232.000.

Albert Koch: *See—*
Horn, Petr, 4,840,494, Cl. 374-1.000.

Alcan International Limited: *See—*
Tomaka, Jan Z., 4,840,127, Cl. 105-406.100.

Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M. Medium for gas laser excited by ionizing particles. 4,841,537, Cl. 372-55.000.

Alexandrovich, Peter S.: *See—*
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.

Alfa-Laval Marine and Power Engineering AB: *See—*
Pallmar, Anders, 4,840,612, Cl. 494-2.000.

Alfred Grass Ges.m.b.H. Metallwarenfabrik: *See—*
Grass, Alfred, 4,839,940, Cl. 16-258.000.

Alfred Teves GmbH: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.
Latka, Franz, 4,841,158, Cl. 307-10.100.
Schiel, Lothar, 4,840,193, Cl. 137-627.500.
Schonlau, Juergen; Birkenbach, Alfred; and Harth, Ralf, 4,840,433, Cl. 303-9.680.
Steffes, Helmut, 4,840,435, Cl. 303-116.000.
Tandler, Peter; and Cezanne, Rudolf, 4,841,107, Cl. 200-84.00C.

Allen, Andrew W.: *See—*
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.

Allen, James L.: *See—*
Elleman, Daniel D.; Allen, James L.; and Lee, Mark C., 4,840,496, Cl. 374-124.000.

Allied Products Corporation: *See—*
Pingry, Larry J., 4,840,019, Cl. 56-13.600.

Allied-Signal Inc.: *See—*
Chai, Bruce H.; Lai, Shui T.; and Long, Margaret N., 4,841,530, Cl. 372-41.000.
Moore, David J., 4,840,594, Cl. 445-7.000.
Woodworth, Lee R.; and Rowlett, Beb H., 4,840,645, Cl. 55-1.000.
Zeno, John R., 4,841,292, Cl. 340-736.000.

Allmineral Aufbereitungstechnik GmbH & Co. KG: *See—*
Jungmann, Andreas; and Reilard, Ulrich, 4,840,753, Cl. 261-76.000.

Allstar Vergrauchsguter GmbH: *See—*
Richter, Hans-Jurgen, 4,840,361, Cl. 269-289.00R.

Alps Electric Co., Ltd.: *See—*
Ouchi, Junichi, 4,841,141, Cl. 250-221.000.
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Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., to Colt Industries Inc. Electromagnet, valve assembly and fuel metering apparatus. 4,840,163, Cl. 123-533.000.

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Bourcier, Pierre; and Riollet, Gilbert, 4,840,539, Cl. 416-191.000.
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,840,221, Cl. 165-41.000.

Altendorf, Hans-Walter, to Siemens Aktiengesellschaft. Dental equipment having means for delivering RF and LF energy to a dental handpiece. 4,840,563, Cl. 433-29.000.

Althoff, Karl-Heinz, to O & K Orenstein & Koppel AG. Apparatus for transporting loads. 4,840,533, Cl. 414-495.000.

Aluminum Company of America: *See—*
Hyland, M. Elise; and Hunt, Warren H., Jr., 4,840,852, Cl. 428-654.000.

AM International, Inc.: *See—*
Szczesniak, Stanley J., 4,840,121, Cl. 101-415.100.

Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, to Hitachi, Ltd. Method and system for bidirectionally transmitting data. 4,841,521, Cl. 370-31.000.

Amano, Toshio: *See—*
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Ambic Equipment Limited: *See—*
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Amdahl Corporation: *See—*
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American Air Liquide: *See—*
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American Bionetics, Inc.: *See—*
Littlehales, William J., 4,840,714, Cl. 204-180.100.

American Maize-Products Company: *See—*
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American Standard Inc.: *See—*
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Moilanen, John R., 4,840,545, Cl. 417-301.000.

American Telephone and Telegraph Company: *See—*
Lee, Wha-Joon, 4,841,500, Cl. 368-120.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Delaney, Robert H.; Kalmanek, Charles R., Jr.; and Restrick, Robert C., III, 4,841,295, Cl. 340-825.500.
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Amin Engineers Ltd.: *See—*
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Ammeraal, Robert N.; Hedges, Allan R.; and Gottneid, David J., to American Maize-Products Company. Purification and separation of branched beta-cyclodextrins. 4,840,679, Cl. 127-40.000.

Amoco Corporation: *See—*
Kelsey, Donald R., 4,841,009, Cl. 528-75.000.
Olsen, Robert J., 4,841,069, Cl. 548-545.000.

Amonett, Daniel K., to Emhart Industries, Inc. Timing mechanism with cam and switch arrangement. 4,841,110, Cl. 200-574.000.

AMP Incorporated: *See—*
Goodman, Joseph R.; and Thrush, Roger L., 4,841,105, Cl. 200-16.00D.
Leufert, Walter P.; and Miller, David L., 4,840,581, Cl. 439-472.000.
Long, Alden O., Jr., 4,839,962, Cl. 29-749.000.
Steely, Lee W., 4,841,520, Cl. 370-13.000.

Ampro Photo Workshops Limited: *See—*
Baker, Ralph E.; and Landherr, Gordon G., 4,840,415, Cl. 294-1.100.

Ams, Felix; and Schafer, Roland, to Richard Wolf GmbH. Endoscopic video system. 4,841,363, Cl. 358-98.000.

Analgesic Associates: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,840,962, Cl. 514-406.000.

Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., to Dow Chemical Company, The. Tetrabromo bisphenol based polyestercarbonate membranes and method of using. 4,840,646, Cl. 55-16.000.

Anderson, Allen B. Power driven underwater viewing platform. 4,840,592, Cl. 441-135.000.

Anderson, David W., to Eleanor Roosevelt Institute for Cancer Research, Inc. Therapeutic method using T cell growth factor. 4,840,934, Cl. 514-2.000.

Anderson, Donald R.: *See—*
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kersh, Douglas W., 4,841,456, Cl. 364-550.000.

Anderson, James H.: *See—*
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.

Anderson, Roy E., to Mobile Satellite Corporation. Low cost method and system for automatically steering a mobile directional antenna. 4,841,303, Cl. 342-359.000.

Anderson, William B., to Rexnord Inc. Apron type conveyor. 4,840,269, Cl. 198-822.000.

Ando, Yoshiyasu: *See—*
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Andrus, Bryan: *See—*
Oglesby, Gary; and Andrus, Bryan, 4,840,372, Cl. 272-72.000.

Angelini, Sergio. Automatic plant for continuous electroplating treatment of metal bars. 4,840,716, Cl. 204-207.000.

Angelucci, Ernest A., to Unisys Corporation. Test probe accessibility method and tool. 4,841,231, Cl. 324-73.00R.

Anheuser-Busch, Incorporated: *See—*
Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, 4,841,457, Cl. 364-557.000.

Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., to Westinghouse Electric Corp. Method for vapor phase soldering. 4,840,305, Cl. 228-232.000.

Antunez, Bruce A. Bi-stable, three condition flush tank system. 4,840,196, Cl. 137-410.000.

Antus, Sandor: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Aoki, Hiroyuki; Yahagi, Shinichiro; and Saito, Takanobu, to Nissan Motor Company Ltd.; and Daido Tokushuko Kabushiki Kaisha. Torque detecting device. 4,840,073, Cl. 73-862.360.

Aoki, Kozo: *See—*
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.

Aoki, Toshikazu: *See—*
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Aoshima, Shinichiro; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Voltage detector utilizing an optical probe of electro-optic material. 4,841,234, Cl. 324-96.000.

Aoyagi, Yoshio, to Pioneer Electronic Corporation. Pickup position control method enabling restart of reproduction after interruption. 4,841,505, Cl. 369-32.000.

Aoyagi, Yoshio: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.

Aoyama, Hirokazu: *See—*
Fukui, Shosin; Shinjo, Masayoshi; and Aoyama, Hirokazu, 4,840,675, Cl. 106-38.220.

Appel, Jean: *See—*
Richard, Philippe; Soulage, Andre ; and Appel, Jean, 4,841,304, Cl. 342-460.000.

Appelgren, Curt H.; Eskilsson, Eva C.; and Uvdal, Jonas P., to Lejus Medical Aktiebolag. Process for preparing rapidly disintegrating granulates. 4,840,799, Cl. 424-493.000.

Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., to United States of America, Energy. Method of fabricating optical waveguides by ion implantation doping. 4,840,816, Cl. 427-38.000.

Applied Techniques Inc.: *See—*
Pine, Bob G., 4,840,267, Cl. 198-498.000.

Aqualon Company: *See—*
Just, Ernst K.; and Nickol, Robert G., 4,841,040, Cl. 536-105.000.

ARA - Werk Kramer GmbH & Co.: *See—*
Segatz, Wilhelm, 4,840,293, Cl. 222-94.000.

Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, to Toa Nenryo Kogyo Kabushiki Kaisha. Inorganic polysilazane and method of producing the same. 4,840,778, Cl. 423-324.000.

Arai, Ryuichiro: *See*—
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.

Arai, Takashi, to Canon Kabushiki Kaisha. Metal mold structure for molding multi-layer resin. 4,840,553, Cl. 425-129.100.

Arai, Tetsuji, to Ushio Denki. Method of treating photoresists. 4,840,876, Cl. 430-328.000.

Arai, Tetsuji: *See*—
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.

Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reflecting-/refractive optical system. 4,840,472, Cl. 350-442.000.

Arai, Yoshio: *See*—
Kobayashi, Hideo; and Arai, Yoshio, 4,840,428, Cl. 297-408.000.

Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Toothed belt. 4,840,608, Cl. 474-205.000.

Arbizzani, Tommaso, to Sodibo S.p.A. Dried load detector for dry-cleaning machines. 4,840,065, Cl. 73-295.000.

Arch, Paul E.; and Niemann, Edwin H., to Arco Chemical Technology, Inc. Isopentane as blowing agent to improve coffee retention in foam cups molded from expandable polystyrene. 4,840,759, Cl. 264-53.000.

Archer, Timothy H. V.; and Sutera, Richard, to Burlington Industries, Inc. Multi-color fluid jet pattern generator for textiles. 4,841,306, Cl. 346-1.100.

Arco Chemical Technology, Inc.: *See*—
Arch, Paul E.; and Niemann, Edwin H., 4,840,759, Cl. 264-53.000.

Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, to Fujikura Rubber, Ltd. Pneumatically-operated valve. 4,840,347, Cl. 251-63.400.

Arimoto, Akira: *See*—
Mochizuki, Takeshi; Arimoto, Akira; and Saito, Susumu, 4,841,137, Cl. 250-236.000.

Arismendi, A. M. (Andy), Jr.: *See*—
Jackson, John R., 4,841,250, Cl. 324-349.000.

Aristodimou, Emilios. Stone tiles. 4,840,825, Cl. 428-77.000.

Arita, Koji: *See*—
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.

Ariyavisitakul, Sirikiat: *See*—
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.

Ariyoshi, Kimio: *See*—
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.

Armco Inc.: *See*—
Arnett, Charles R.; and Bruner, James P., 4,840,686, Cl. 148-334.000.

Armstrong, David I.: *See*—
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

Armstrong, William D., to Scientific Design Company, Inc. Process for the oxidation of ethylene to ethylene oxide. 4,841,080, Cl. 549-536.000.

Arnett, Charles R.; and Bruner, James P., to Armco Inc. Bainitic core grinding rod. 4,840,686, Cl. 148-334.000.

Arnold, Halan P.: *See*—
Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., 4,840,008, Cl. 53-137.000.

Arzoumanian, Aram: *See*—
Wong, Kam C.; Rubinshtein, Bernard; and Arzoumanian, Aram, 4,840,501, Cl. 400-124.000.

Asada, Katsuhiko: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Endo, Takeshi; Nambu, Yoko; and Yamamoto, Kazutoshi, 4,841,058, Cl. 546-257.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Nejigaki, Tatuo; and Kakutani, Yoshimi, 4,840,769, Cl. 422-26.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Arai, Yasunori, 4,840,472, Cl. 350-442.000.
Kawasaki, Masahiro; and Sato, Osamu, 4,841,322, Cl. 354-400.000.

Asahina, Yasuo: *See*—
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.

Asai, Masahiko: *See*—
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, 4,840,326, Cl. 242-199.000.

Asami, Kazuo; and Ogasawara, Fumihiro, to Ricoh Company, Ltd. Facsimile transmission control method in which a frame of stored image data is transmitted when either a predetermined time has elapsed or a predetermined amount of image data has been stored. 4,841,373, Cl. 358-257.000.

Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, to Matsushita Electric Industrial Co., Ltd.; Sanyo Electric Co., Ltd.; Mitsubishi Denki Kabushiki Kaisha; and Sharp Corporation. Tag Data processing apparatus for a data flow computer. 4,841,436, Cl. 364-200.000.

Asanuma, Yasuo: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Asao, Kouichiro: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 4,840,847, Cl. 428-373.000.

Ashland Oil, Inc: *See*—
Culbertson, Billy M.; and Tiba, Omar, 4,841,002, Cl. 525-504.000.

Ashley, Paul R.: *See*—
Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., 4,840,816, Cl. 427-38.000.

Aso, Akira, to NEC Corporation. Semi-custom integrated circuit provided with standardized capacitor cells. 4,841,352, Cl. 357-45.000.

Asoh, Seiichi, to Mazda Motor Corporation. Automotive rear underbody structure. 4,840,424, Cl. 296-204.000.

Atlantic Richfield Company: *See*—
Levine, Robert A., 4,840,729, Cl. 210-170.000.
Wakefield, John J., Jr., 4,840,726, Cl. 208-152.000.

Atlas Air (Australia) Pty, Limited: *See*—
Marton, Lewis, 4,841,122, Cl. 219-273.000.

Atsumi, Hiroaki: *See*—
Sasaki, Akihiko; and Atsumi, Hiroaki, 4,841,382, Cl. 360-32.000.

Attar, Amir J., to Perfect View, Inc. Gas dosimeter for colorimetrically indicating the presence of amides. 4,840,919, Cl. 436-111.000.

Audus, David: *See*—
Gabriel, David; Audus, David; and Strange, Norman, 4,840,490, Cl. 356-375.000.

Auerbach, Gunther; and Moser, Helmut A., to Sandoz Ltd. Monoazo compounds having a 6-(5'-chloro-2',4'-difluoropyrimid-6'-ylamino)-1-hydroxy-3-sulfonaphthalene group and their use as dyes. 4,840,642, Cl. 8-549.000.

Auergesellschaft GmbH: *See*—
Dahrendorf, Klaus-Dieter; Huennebeck, Volker; and Hoffman, Wilfried, 4,840,170, Cl. 128-202.260.

August, John L., Jr.: *See*—
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., 4,840,450, Cl. 350-96.200.

August Sauter GmbH: *See*—
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, 4,841,280, Cl. 340-706.000.

Augustin, Eugene P. Microwave rotary junction with external rotary energy coupling. 4,841,261, Cl. 333-21.00A.

Augustin, Ulrich: *See*—
Notz, Wolfgang; Schwarz, Volker; and Augustin, Ulrich, 4,840,060, Cl. 73-119.00A.

Augustine, Douglas J.: *See*—
Augustine, Scott D.; and Augustine, Douglas J., 4,840,172, Cl. 128-207.140.

Augustine, Scott D.; and Augustine, Douglas J. Device for positioning an endotracheal tube. 4,840,172, Cl. 128-207.140.

Ausimont S.p.A.: *See*—
Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, 4,840,994, Cl. 525-72.000.

Ausnit, Steven: *See*—
Van Erden, Donald L.; and Ausnit, Steven, 4,840,611, Cl. 493-213.000.

Austin, Frederick D.; Barclay, John L.; and Hunter, James O., to British Petroleum Company p.l.c., The. Hydrocarbons pyrolysis. 4,840,723, Cl. 208-106.000.

Australian Building Industries Pty. Ltd.: *See*—
Cochrane, Ronald, 4,840,005, Cl. 52-667.000.

Avancas, Napoleon G., to Grumman Aerospace Corporation. High speed data-clock synchronization processor. 4,841,551, Cl. 375-118.000.

Awazu, Koichi, to Kabushiki Kaisha Toshiba. Display controller with a variable scrolling speed, and method for operating same. 4,841,454, Cl. 364-521.000.

B. F. Goodrich Company, The: *See*—
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.

B. V. Gerbs. ter Braak: *See*—
van der Schaaf, Herman J., 4,840,678, Cl. 127-2.000.

Baba, Hisatoshi; Imokawa, Naoki; and Shiho, Makoto, to Canon Kabushiki Kaisha. Magnetic field generator having a plurality of coils for generating magnetic field in substantially the same space and method of driving the same. 4,841,407, Cl. 361-146.000.

Baba, Takeshi: *See*—
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.

Babcock & Wilcox Company, The: *See*—
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.
Mizerak, Dennis S., 4,841,413, Cl. 361-400.000.

Babyak, Richard M.: *See*—
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., 4,840,591, Cl. 441-106.000.

Baes, Emile, to Redco N.V. Lightweight insulating boards and process for manufacturing same. 4,840,672, Cl. 106-86.000.

Baggio, Horacio A.; and Eckart, George R., to Woodhead Industries, Inc. String lights for construction sites. 4,841,420, Cl. 362-249.000.

Baika, Toyokazu: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Bailey, Steven P.: *See—*
Gualits, Vladimir S.; and Bailey, Steven P., 4,840,259, Cl. 192-48.200.

Baker, Brian N.: *See—*
Campbell, John S.; Baker, Brian N.; and Katyal, Anil, 4,840,774, Cl. 423-79.000.

Baker Hughes: *See—*
Lillywhite, M. James; and Horn, Michael J., 4,840,283, Cl. 220-5.00A.

Baker Hughes Incorporated: *See—*
Berzin, Vel; and Mendez, Luis E., 4,840,231, Cl. 166-387.000.

Baker International Corporation: *See—*
LeBegue, Manrice K.; and Wilson, Henry E., 4,840,432, Cl. 299-64.000.

Baker, Ralph E.; and Landherr, Gordon G., to Ampro Photo Workshops Limited. Apparatus to move negatives. 4,840,415, Cl. 294-1.100.

Bakken, Theresa A.: *See—*
Johnson, Philip S.; and Bakken, Theresa A., 4,840,786, Cl. 424-43.000.

Balbierz, Daniel J., to Menlo Care, Inc. Protective sheath for catheter assembly. 4,840,613, Cl. 604-51.000.

Bales, Stephen E.: *See—*
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-16.000.

Bally Manufacturing Corporation: *See—*
Oglesby, Gary; and Andrus, Bryan, 4,840,372, Cl. 272-72.000.

Banks, Gilbert H., to Bev-Cap Plastics Pty. Ltd. Syringe hypodermic needle. 4,840,616, Cl. 604-110.000.

Banno, Hisao, to NGK Spark Plug Co., Ltd. Underwater piezoelectric arrangement. 4,841,494, Cl. 367-157.000.

Banzai, Hideo: *See—*
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.

Baran, Michael S.: *See—*
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.

Barbee, Robert B., to Eastman Kodak Company. Polyesters with improved gas barrier properties. 4,841,012, Cl. 528-125.000.

Barclay, John L.: *See—*
Austin, Frederick D.; Barclay, John L.; and Hunter, James O., 4,840,723, Cl. 208-106.000.

Barclay, Randel L. Rubber crumb recovery from vehicle tires. 4,840,316, Cl. 241-279.000.

Bard Limited: *See—*
Brazier, Gary B., 4,840,187, Cl. 128-844.000.

Barmbilla, Luigi: *See—*
Katz, Egon; Bossenmaier, Alban; and Barmbilla, Luigi, 4,840,397, Cl. 280-739.000.

Barney, Jonathan A.; and Karunaratne, Arjuna R., to Lutron Electronics Co., Inc. Position-sensing circuit. 4,841,221, Cl. 323-320.000.

Barry, Irwin M. Nest extermination kit. 4,839,985, Cl. 43-132.100.

Bart, Hansueli: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.

Bartley, Donald L., to Kennametal Inc. Expanding mandrel. 4,840,360, Cl. 269-48.100.

Bartz, Wilfried, to Huels Aktiengesellschaft. Impact-resistant polyamide molding compounds. 4,840,993, Cl. 525-66.000.

BASF Aktiengesellschaft: *See—*
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.
Guentner, Andreas; Mayer, Udo; and Oberlinner, Andreas, 4,841,050, Cl. 544-150.000.
Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, 4,840,990, Cl. 524-504.000.
Ostertag, Werner, 4,840,677, Cl. 106-456.000.
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, 4,840,736, Cl. 210-727.000.
Weber, Reinhold; Zuern, Ludwig; and Weilbacher, Manfred, 4,840,976, Cl. 521-79.000.

Baskett, Theodore N. Trailer hitch guide. 4,840,392, Cl. 280-477.000.

Bass, Eric: *See—*
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., 4,840,591, Cl. 441-106.000.

Basso, Egidio. Light-sensitive switch structure and method with inverse off/on ratio. 4,841,164, Cl. 307-117.000.

Bata, John I.: *See—*
Jonelis, John A.; and Bata, John I., 4,840,649, Cl. 55-140.000.

Bateman, Glenn; and Brand, Donald L., to Tektronix, Inc. Digital time base with corrected analog interpolation. 4,841,497, Cl. 368-113.000.

Battelle-Institut e.V.: *See—*
Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, 4,841,139, Cl. 250-223.00R.

Bauer, Barney J.: *See—*
Higbee, Wallace C.; and Bauer, Barney J., 4,840,324, Cl. 242-107.600.

Bauer, Karl-Heinz; and Eckert, Gerold, to Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co. Air outlet device. 4,840,114, Cl. 98-2.000.

Baum, Gary A.; and Habeger, Charles C., Jr., to Institute of Paper Chemistry, The. Method and apparatus for measuring fiber orientation anisotropy. 4,841,223, Cl. 324-58.50A.

Baumann, Karl-Heinz: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Baumgartner, Hans; Brandstadter, Manfred; and Henke, Ulrich, to Pierburg GmbH. Internal axis rotary piston engine with protrusions having two sealing corners. 4,840,550, Cl. 418-150.000.

Bausch, Max: *See—*
Herzog, Siegfried; Eckert, Dieter; and Bausch, Max, 4,840,475, Cl. 350-604.000.

Bauser, Herbert; Schindler, Bernd; and Chmiel, Horst, to Fraunhofer Geselschaft E.V. Modifying the surface of the interior pore walls of objects such as membranes with gas activated by partial brush discharge. 4,840,636, Cl. 8-115.520.

Baxter Healthcare Corporation: *See—*
Miller, Robert A.; and Stone, Albert L., 4,840,017, Cl. 53-468.000.

Baxter, John: *See—*
Bishop, Arthur E.; and Baxter, John, 4,840,197, Cl. 137-625.210.

Bayer Aktiengesellschaft: *See—*
Brack, Alfred, 4,840,641, Cl. 8-534.000.
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.
Gayer, Herbert; and Jelich, Klaus, 4,841,086, Cl. 558-301.000.
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Habich, Dieter; and Hartwig, Wolfgang, 4,841,042, Cl. 540-200.000.
Hagemann, Hermann; and Sasse, Klaus, 4,841,089, Cl. 558-412.000.
Harnisch, Horst; and Raue, Roderich, 4,841,052, Cl. 544-361.000.
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.
Holmwood, Graham; Weissmuller, Joachim; Brandes, Wilhelm; and Reinecke, Paul, 4,840,961, Cl. 514-399.000.
Jager, Horst, 4,841,030, Cl. 534-638.000.
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
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Tarnow, Horst; and Homeyer, Bernhard, 4,840,969, Cl. 514-617.000.

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Johnson, Paul; and Karnebogen, Karl W., 4,840,115, Cl. 98-2.030.
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BBC Brown Boveri AG: *See—*
Koromzay, Tibor, 4,841,117, Cl. 219-76.100.

Beachell, Vicki T., to ICI Americas Inc. Nonalcoholic sunscreen gel. 4,840,788, Cl. 424-59.000.

Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., to Casco Products Corporation. Liquid level gauging apparatus. 4,840,137, Cl. 116-227.000.

Bechdel, John F.: *See—*
Mitchell, James A.; and Bechdel, John F., 4,841,476, Cl. 364-900.000.

Beck, Anton K.: *See—*
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.

Becker, Horst P.: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.

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Beckman Instruments, Inc.: *See—*
Shope, William H., 4,841,151, Cl. 250-364.000.

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Burns, James A., 4,840,908, Cl. 435-296.000.
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., 4,840,690, Cl. 156-242.000.
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Welschof, Hans-Heinrich; and Beier, Rudolf, 4,840,087, Cl. 74-713.000.

Beihoff, Bruce C.: *See—*
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.
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Belka, Heinrich, to Esge-Marby GmbH & Co., KG. Bicycle luggage carrier attachment arrangement. 4,840,298, Cl. 224-39.000.

Bell, Malcolm R.: *See—*
D'Ambra, Thomas E.; and Bell, Malcolm R., 4,840,950, Cl. 514-235.200.

Bell, Ramona R. External catheter urine collection system. 4,840,625, Cl. 604-352.000.

Bellos, Thomas J.; and Lovett, Eva G., to Petrolite Corporation. Polyalkanolamines. 4,840,748, Cl. 252-344.000.

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Frank, David S.; and Belly, Robert T., 4,840,784, Cl. 424-3.000.

Beltzer, Morton; and Jahanmir, Said, to Exxon Research and Engineering Company. Ashless anti-wear additives. 4,840,741, Cl. 252-47.000.

Ben-Sasson, Shmuel, to Rafa Laboratories. Preparation and method for effecting fat and lipid adsorption. 4,840,795, Cl. 424-690.000.

Benda, John A.: *See—*
Sziklas, Edward A.; and Benda, John A., 4,841,541, Cl. 372-94.000.

Bendix Electronics Limited: *See—*
Cook, John E., 4,840,350, Cl. 251-129.110.

Benedetti, Enzo: *See—*
Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, 4,840,994, Cl. 525-72.000.

Benim, Thomas E., to Du Pont de Nemours, E. I., and Company. Method for unwinding elastic tape. 4,840,695, Cl. 156-344.000.

Bentley, Douglas P.: *See—*
Price, Zane A.; and Bentley, Douglas P., 4,839,945, Cl. 24-49.00R.

Benvegar, Carl E.: *See—*
Charbonnier, Francis M.; Rockwell, Martin G.; and Benvegar, Carl E., 4,840,177, Cl. 128-419.00D.

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Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,841,316, Cl. 354-4.000.

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Bernot, Anthony J.; and Johnson, Michael J., to Honeywell Inc. Apparatus and method for providing a gray scale capability in a liquid crystal display unit. 4,840,460, Cl. 350-333.000.

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Berry, Richard C., to Cooper Industries, Inc. Explosion proof electrical conduit sealing fitting. 4,840,194, Cl. 138-155.000.

Bertke, James H.: *See—*
Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., 4,840,026, Cl. 60-271.000.

Berzin, Vel; and Mendez, Luis E., to Baker Hughes Incorporated. Method and apparatus for setting an inflatable packer. 4,840,231, Cl. 166-387.000.

Bethlehem Steel Corporation: *See—*
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., 4,840,671, Cl. 106-85.000.
Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, 4,840,712, Cl. 204-28.000.

Betts, John E.; and Toledo, George, to Thomas Industries Inc. Panic exit device. 4,839,988, Cl. 49-141.000.

Betz Laboratories, Inc.: *See—*
Reid, Dwight K., 4,840,720, Cl. 208-48.0AA.

Bev-Cap Plastics Pty. Ltd.: *See—*
Banks, Gilbert H., 4,840,616, Cl. 604-110.000.

Beyrer, Karl-Heinz: *See—*
Nussbaumer, Walter; and Beyrer, Karl-Heinz, 4,840,095, Cl. 82-117.000.

Bezos, Angel P.: *See—*
Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., 4,840,056, Cl. 73-1.00H.

Bhadra, Dilip K.; Creedon, Richard L.; and Harder, C. Ross, to GA Technologies Inc. Combined valve/cylinder using electro-rheological fluid. 4,840,112, Cl. 91-459.000.

Bhatia, Usha: *See—*
Hyldon, Roy; and Bhatia, Usha, 4,840,806, Cl. 426-270.000.

Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., to Montedison S.p.A. Modified polyisocyanates with biuret structure and process for their preparation. 4,841,095, Cl. 560-115.000.

Bibracher, Wilhelm; and Hauser, Josef, to Siemens Aktiengesellschaft. Electron beam catcher for velocity modulated electron tubes. 4,840,595, Cl. 445-28.000.

Bickler, Donald B., to United States of America, National Aeronautics and Space Administration. Articulated suspension system. 4,840,394, Cl. 280-677.000.

Bidal, Rene M. R., to Ste Look. Device for fastening a shoe on a bicycle pedal. 4,840,086, Cl. 74-594.600.

Biddlecombe, Thomas W. Hand and digit exerciser. 4,840,370, Cl. 272-68.000.

Biedermann, Kurt: *See—*
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, 4,840,828, Cl. 428-120.000.

Biehler, Wolfgang: *See—*
Rieger, Hansjorg W.; and Biehler, Wolfgang, 4,840,399, Cl. 280-757.000.

Biersdorff, Jack L., to C & K Systems, Inc. Infrared intrusion detection system incorporating a fresnel lens and a mirror. 4,841,284, Cl. 340-567.000.

Bikson, Benjamin: *See—*
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.

Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., to CL Pharma Aktiengesellschaft. Isoxazole derivatives with antiviral activities and pharmaceutical products containing these. 4,841,065, Cl. 548-238.000.

Bingham, George H. Method and apparatus for testing relief valve. 4,840,057, Cl. 73-4.00R.

Bipolar Integrated Technology, Inc.: *See—*
Miller, Bruce E.; and Owen, Robert E., 4,841,468, Cl. 364-754.000.

Birch, Barry, to Lucas Industries Public Limited Company. Gauge driving system. 4,841,238, Cl. 324-144.000.

Birgmeir, Klaus, to Agfa - Gevaert Aktiengesellschaft. Apparatus and method for the reproduction of colored originals with gray balance and/or contrast adjustment. 4,841,360, Cl. 358-80.000.

Birkenbach, Alfred: *See—*
Schonlau, Juergen; Birkenbach, Alfred; and Harth, Ralf, 4,840,433, Cl. 303-9.680.

Birkholz, Ulrich; Haertl, Christof; and Nassler, Peter, to Siemens Aktiengesellschaft. Apparatus for srewing a cover onto a screw neck of a hearing aid. 4,840,249, Cl. 181-129.000.

Bishop, Arthur E.; and Baxter, John. Power steering valve. 4,840,197, Cl. 137-625.210.

Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, to North American Philips Corp. Side-looking speed sensor. 4,841,243, Cl. 324-174.000.

Bisping, Heinz; Leibhard, Erich; and Mauthe, Peter, to Hilti Aktiengesellschaft. Anchor member with electrical insulation jacket. 4,840,524, Cl. 411-82.000.

Bisson, Joel, to Northern Telecom Limited. Asynchronous processor arbitration circuit. 4,841,178, Cl. 307-518.000.

Bleckmann, Hugo: *See—*
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Blenkhorn, Gary P., to S. D. Warren Company. Replicating process for interference patterns. 4,840,757, Cl. 264-22.000.

Bleser, Edward M.: *See—*
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Block, Aleck. Abrasive apparatus. 4,839,998, Cl. 51-376.000.

Block, Frank: *See—*
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Bloom, Jerome P.: *See—*
Denman, Stephen A., 4,840,601, Cl. 464-157.000.

Blumenthal, Michael. Artificial eye lens and method of transplanting same. 4,840,627, Cl. 623-6.000.

Board of Regents, The University of Texas System: *See—*
Weldon, William F., 4,840,107, Cl. 89-8.000.
Weldon, William F., 4,841,185, Cl. 310-115.000.

Board of Regents, University of Texas System: *See—*
Farquhar, David; and Wang, Yuqiang, 4,841,085, Cl. 538-180.000.

Bockenheuser, Charles A., to Pardners Unlimited, Inc. Protective shield and method of fastening protective shield to a frame. 4,840,418, Cl. 296-91.000.

Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., to Lever Brothers Company. Process for the preparation of an edible fat-containing product. 4,840,810, Cl. 426-312.000.

Boeckmann, Hugo, to Zip-Pak Incorporated. Zippered film feed. 4,840,012, Cl. 53-410.000.

Boehringer Mannheim GmbH: *See—*
Grosskopf, Rudiger; and Kessler, Christoph, 4,840,901, Cl. 435-91.000.
Kearns, Michael J.; and Comer, Michael J., 4,840,905, Cl. 435-240.250.

Boeing Company, The: *See—*
Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., 4,840,682, Cl. 148-12.70A.
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kersh, Douglas W., 4,841,456, Cl. 364-550.000.

Bogoch, Samuel, to Brain Research, Inc. Method for diagnosing malignant tumors. 4,840,915, Cl. 436-530.000.

Bohler, Erwin: *See—*
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Boie, Immo: *See—*
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Bon, Michel: *See*—
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Bonnefoy, Jean, to Bull S.A. Method and apparatus for measuring the thermal resistance of an element such as large scale integrated circuit assemblies. 4,840,495, Cl. 374-43.000.
Bonnet, Bernard, to Framatome. Element for filtering stress variations in a bolted assembly. 4,840,521, Cl. 411-14.000.
Bontemps, Guy: *See*—
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Boratto, Francisco; Yue, Stephen; and Jonas, John J., to Ipsco Inc. Steel rolling using optimized rolling schedule. 4,840,051, Cl. 72-11.000.
Borden, Inc.: *See*—
Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., 4,840,808, Cl. 426-270.000.
Boris, Allen J.: *See*—
Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, 4,840,390, Cl. 280-250.100.
Boros, Leslie A. Convertible footwear. 4,839,948, Cl. 24-662.000.
Borrelli, Nicholas F.; and Wedding, Brent M., to Corning Glass Works. Method for making colored photochromic glasses. 4,840,655, Cl. 65-30.110.
Borsa, Massimiliano: *See*—
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Borsani, Paolo, to Tecno S.p.A. Mobili e Forniture per Arredamento. Flexible cable guide with two-directional joints. 4,840,023, Cl. 59-78.100.
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Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., to NDT Instruments, Inc. Ultrasonic thickness gauge having automatic transducer recognition and parameter optimization and method thereof. 4,840,066, Cl. 73-597.000.
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Botsolas, Chris J., to Botsolas, Carol M. Two piece pipe fitting cover. 4,840,201, Cl. 138-178.000.
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, to Vorwerk & Co. Interholding GmbH. Structural element formed of a resin-hardened velour fabric and fabrication method. 4,840,828, Cl. 428-120.000.
Boula, Gerard; and Georges, Alain, to Framatome. Process for the installation of tubes in a steam generator. 4,839,951, Cl. 29-157.400.
Bourcier, Pierre; and Riollet, Gilbert, to Alsthom. Moving blading for steam turbines. 4,840,539, Cl. 416-191.000.
Bourdonne, Jean-Claude, to Framatome. Gripping device for tensioning screwing elements. 4,840,526, Cl. 411-263.000.
Bourgeaux, Pierre; and Riaud, Alain, to S.A. Des Etablissements Staubli. Displacement coder. 4,841,297, Cl. 341-11.000.
Bourgois, Luc, to N. V. Bekaert S. A. Tire belt reinforcing strip and method of making of same. 4,840,214, Cl. 152-527.000.
Boursier, Bernard, to Roquette Freres. Confectionery or pharmaceutical product with a sugarless coating obtained by hard coating and method for its preparation. 4,840,797, Cl. 424-475.000.
Bowcutt, Corey H.: *See*—
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Bowles, Gary L., to Heinmiller, Wesley H. D. C. power controller. 4,841,165, Cl. 307-132.00R.
Bowser, C. Frederick; and Kurtz, John L., to Bowser, C. Frederick. Electrical tape boundary sensor apparatus. 4,840,377, Cl. 273-31.000.
Brack, Alfred, to Bayer Aktiengesellschaft. Cationic diazacyanine dyestuffs for dyeing polyacrylonitrile-wool blends. 4,840,641, Cl. 8-534.000.
Brain Research, Inc.: *See*—
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Brandt, Lennart H., to AB Volvo Penta. Propeller drive for boats. 4,840,136, Cl. 440-78.000.
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., to United States of America, Army. Method of making a cathode from tungsten and iridium powders using a barium iridiate formed from barium peroxide and iridium oxide as the impregnant. 4,840,767, Cl. 419-27.000.
Brazier, Gary B., to Bard Limited. Sheath applicator. 4,840,187, Cl. 128-844.000.
Breaux, Vance V. Underwater exhaust system for boats of stepped-hull construction and including exhaust cooling. 4,840,589, Cl. 440-89.000.
Bremer, Ross L.; and Hogshead, Howard P., to Bremer, Ross L. Apparatus for positioning and supporting a patient for spinal surgery. 4,840,362, Cl. 269-328.000.
Breneman, Bruce C.: *See*—
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Bridgestone Corporation: *See*—
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British Petroleum Company p.l.c., The: *See*—
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Winter, Christopher S.; and Kashyap, Raman, 4,840,461, Cl. 350-346.000.
Brodowski, Walter, to Akzo N.V. Melt-processable, thermotropic, fully aromatic polyesters. 4,841,014, Cl. 528-191.000.
Bron, Michel: *See*—
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Brookman, Donald L.; Merrill, David E.; and Grollimund, Everett C., to Philip Morris Incorporated. Methods and apparatus for handling double-sided adhesive tabs. 4,840,694, Cl. 156-344.000.
Brooktree Corporation: *See*—
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Browning, James A. High-velocity controlled-temperature plasma spray method and apparatus. 4,841,114, Cl. 219-121.470.
Brubaker, Clifford E.; and McLaurin, Colin A., to University of Virginia Alumni Patents Foundation, The. Lever drive apparatus. 4,840,076, Cl. 74-143.000.
Bruckert, Serge: *See*—
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Brudal, Hans N.: *See*—
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Brunel, Andre, to Robert Bosch GmbH. Fuel injection pump. 4,840,162, Cl. 123-506.000.
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Brunswick Corporation: *See*—
Staerzl, Richard E., 4,840,148, Cl. 123-73.00A.

Brunt, Charles D., Jr. Regulator safety valve. 4,840,199, Cl. 137-883.000.

Brush Fuses, Inc.: *See*—
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Bryna Pty. Ltd.: *See*—
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Buchal, Christopher J.: *See*—
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Archer, Timothy H. V.; and Sutera, Richard, 4,841,306, Cl. 346-1.100.
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Henry, Samuel B.; and Kuhns, James J., 4,840,437, Cl. 305-10.000.

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Arai, Takashi, 4,840,553, Cl. 425-129.100.
Baba, Hisatoshi; Imokawa, Naoki; and Shiho, Makoto, 4,841,407, Cl. 361-146.000.
Hori, Taizou, 4,841,388, Cl. 360-721.000.
Iwasaki, Akio; and Nagasawa, Kenichi, 4,841,391, Cl. 360-85.000.
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
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Maeda, Masaya, 4,841,397, Cl. 360-105.000.
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Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.
Takahashi, Tsutomu, 4,841,478, Cl. 364-900.000.
Takei, Tetsuya, 4,840,139, Cl. 118-723.000.
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Prager, Lee A.; and Carbone, Douglas C., 4,841,127, Cl. 219-225.000.

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Garret, Michael J., 4,840,376, Cl. 273-14.000.

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Cartwright, David, to Imperial Chemical Industries PLC. Herbicidal pyridine derivatives. 4,840,664, Cl. 71-94.000.

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May, Joe T.; and Casacia, Edward A., 4,841,156, Cl. 250-461.100.

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Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., 4,840,137, Cl. 116-227.000.

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Guichard, Jacques; and Cassimatis, Eric, 4,841,464, Cl. 364-725.000.

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Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, 4,841,084, Cl. 556-464.000.

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Clark, Howard W.; and Chapman, Tracy E., 4,840,676, Cl. 106-462.000.

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Nuytkens, Peter, 4,841,544, Cl. 375-1.000.

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Chenest, Gerard, to Unisys Corporation. Printer with printing shield. 4,840,507, Cl. 400-713.000.

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Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, to Kabushiki Kaisha Frontier; Nippon Unicar Kabushiki Kaisha; and Nittetsu Kougyo Kabushiki Kaisha. Plastic film packaging material. 4,840,823, Cl. 428-35.500.

Chih, Liu P.; and Hwang, Chi Y. Convertible animal toy. 4,840,242, Cl. 180-8.100.

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Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Chinone, Naoki: *See—*
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Ejima, Shozo; Sugihara, Taizo; and Abe, Morio, 4,840,846, Cl. 428-373.000.
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Choi, Hae Y., to Shin, Un Shik. Cap with binoculars. 4,839,926, Cl. 2-199.000.

Christopher, Todd J., to RCA Licensing Corporation. Bit-serial integrator circuitry. 4,841,466, Cl. 364-733.000.

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Quadranti, Marco; Schmidli, Wilheim; and Zoschke, Andreas, 4,840,663, Cl. 71-93.000.
Seitz, Karl, 4,841,049, Cl. 544-76.000.
Tieke, Bernd; and Zahir, Sheik A., 4,840,999, Cl. 525-332.100.
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Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.
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Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, to Anheuser-Busch, Incorporated. Pasteurization monitoring process. 4,841,457, Cl. 364-557.000.
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Codina, Francisco C., to Texsa, S.A. Thermoplastic mass passed between rollers. 4,840,839, Cl. 428-240.000.
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Wormald, Malcolm R., 4,841,153, Cl. 250-390.040.
Cogert, Harmon I., to Short Takes, Inc. Video camera enablement system utilizing a video cassette characteristic. 4,841,378, Cl. 358-335.000.
Coggin, J. Thayer; and Hilton, Robert R., to Thayer Coggin Incorporated. Furniture having wheel axles concealed on one side. 4,839,938, Cl. 16-45.000.
Cohen, Elie, to Societe De Traitement Automatique - Control et Etancheite. Method of leak testing a cavity. 4,840,058, Cl. 73-40.000.
Cohen, Robert; and Charak, Betty J. Clamp mechanism. 4,839,947, Cl. 24-499.000.
Coldeco S.A.: *See*—
Simon, Laszlo; and Pfau, Jean, 4,840,652, Cl. 62-534.000.
Coleco Industries, Inc.: *See*—
Rose, William J., 4,840,602, Cl. 446-175.000.
Coleman, Mike R.: *See*—
Cleary, Edward J., Jr.; Coleman, Mike R.; and Jones, Michael R., 4,841,200, Cl. 315-363.000.
Collins & Aikman Corporation: *See*—
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.
Collins, Dawson M.: *See*—
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., 4,840,607, Cl. 474-167.000.
Coloplast A/S: *See*—
Kamstrup-Larsen, Jorgen, 4,840,692, Cl. 156-252.000.
Color Quest Inc.: *See*—
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,840,669, Cl. 106-19.000.
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,840,670, Cl. 106-19.000.
Colt Industries Inc.: *See*—
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.
Columbia University in the City of New York, The Trustees of: *See*—
Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., 4,840,894, Cl. 435-7.000.
Comark Merchandising, Inc.: *See*—
Krautsack, Richard G., 4,839,977, Cl. 40-658.000.
Combustion Engineering, Inc.: *See*—
Overbay, Mark A., 4,841,118, Cl. 219-124.030.
Comer, Michael J.: *See*—
Kearns, Michael J.; and Comer, Michael J., 4,840,905, Cl. 435-240.250.
Commercial Shearing, Inc.: *See*—
Calcagni, Robert A.; and Sheppa, Alexander, 4,839,935, Cl. 14-24.000.
Commisariat A L'Energie Atomique: *See*—
Lerat, Bernard, 4,840,445, Cl. 350-6.800.
Commissariat a l'Energie Atomique: *See*—
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.
Clerc, Jean-Frederic, 4,841,294, Cl. 340-793.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Watson, Dennis L., 4,840,794, Cl. 424-92.000.
Compagnie Generale D'Electricite: *See*—
Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, 4,840,442, Cl. 350-1.600.
Confalonieri, Carlo: *See*—
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.
Conkling, Charles R., Jr.: *See*—
Hampton, Herbert R.; Fodale, Robert; and Conkling, Charles R., Jr., 4,840,069, Cl. 73-802.000.
Conn-Weld Industries, Inc.: *See*—
Connolly, James D.; and Huff, Darrel, 4,840,728, Cl. 209-405.000.
CONNEI S.p.A.: *See*—
Lancella, Attilio, 4,840,587, Cl. 439-851.000.
Lancella, Attilio, 4,840,588, Cl. 439-851.000.
Connolly, James D.; and Huff, Darrel, to Conn-Weld Industries, Inc. Vibrating screening apparatus. 4,840,728, Cl. 209-405.000.
Conoco Inc.: *See*—
Chittineni, Chittibabu, 4,841,444, Cl. 364-421.000.
Conolly, Daniel D.: *See*—
Greenberg, Norman A.; Chandan, Ramesh C.; Deeslie, William D.; and Conolly, Daniel D., 4,840,813, Cl. 426-565.000.
Conroy, Paul M.: *See*—
Campbell, John R.; Williams, Robert E., Jr.; Brown, Sterling B.; Conroy, Paul M.; and Florence, Robert A., 4,840,982, Cl. 524-151.000.
Cook, John E., to Bendix Electronics Limited. Electrically actuated EGR valve. 4,840,350, Cl. 251-129.110.
Coombs, Paul G.: *See*—
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.
Cooper Industries, Inc.: *See*—
Berry, Richard C., 4,840,194, Cl. 138-155.000.
Hamm, Sidney R., 4,841,108, Cl. 200-148.00A.
Cooper, James A., to United States of America, Energy. One-way transformation of information. 4,841,570, Cl. 380-30.000.
Cooper, Roy; and Hansen, Charles, to Tri-tech, Inc. Stepper motor and method of making the same. 4,841,189, Cl. 310-257.000.
Coopman, Lucien: *See*—
Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, 4,840,203, Cl. 139-453.000.
Corniea, Donald G.: *See*—
Drevfors, Gunnar; Corniea, Donald G.; and Paulson, Norman J., 4,840,205, Cl. 141-2.000.
Corning Glass Works: *See*—
Borrelli, Nicholas F.; and Wedding, Brent M., 4,840,655, Cl. 65-30.110.
Corporation of the City of Toronto, The: *See*—
Dinneen, Maurice J., 4,840,531, Cl. 414-409.000.
Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, to Centre National de la Recherche Scientifique. New hexacoordinate silicon complexes, the process for their preparation and their application. 4,841,084, Cl. 556-464.000.
Cory, Robert M., to General Dynamics Land Systems, Inc. Pin and bushing assembly for shoe assembly of track laying vehicle. 4,840,438, Cl. 305-36.000.
Cosan Chemical Corporation: *See*—
Gaglani, Kamlesh; and Eilender, Albert, 4,841,064, Cl. 548-215.000.
Cosandier, Paul-Andre . Prop support for plants grown in boxes. 4,839,987, Cl. 47-70.000.

Courty, Philippe: *See—*
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, 4,840,783, Cl. 423-648.100.

Cowen, Lisa A.: *See—*
Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., 4,840,894, Cl. 435-7.000.

Cox & Company, Inc.: *See—*
Cox deceased, Duncan B.; and Schuyler, Martin, 4,841,124, Cl. 219-201.000.

Cox deceased, Duncan B.; and Schuyler, Martin, to Cox & Company, Inc. Strain-resistant heated helicopter rotor blade. 4,841,124, Cl. 219-201.000.

Cox, Michael. Mounting plate for attachment of electrical controls and accessories to walls and the like. 4,840,584, Cl. 439-538.000.

Crabill, Carl A., to Harris Corporation. Multiple spiral inductors for DC biasing of an amplifier. 4,841,253, Cl. 330-277.000.

Craft, David C., to Magnetic Peripherals Inc. Static electricity discharge device for a magnetic head. 4,841,395, Cl. 360-103.000.

Creedon, Richard L., to General Atomics. Prestressed tube. 4,840,200, Cl. 138-172.000.

Creedon, Richard L.: *See—*
Bhadra, Dilip K.; Creedon, Richard L.; and Harder, C. Ross, 4,840,112, Cl. 91-459.000.

Cremer, Gerard: *See—*
Beeley, Nigel; and Cremer, Gerard, 4,840,967, Cl. 514-466.000.

Crivello, James V.; and Lee, Julia L., to General Electric Company. Polymeric iodonium salts, method for making, and heat curable compositions. 4,840,977, Cl. 522-25.000.

Crompton & Knowles Corporation: *See—*
Rowe, Jay E., 4,840,643, Cl. 8-641.000.

Crown Unlimited Machine, Incorporated: *See—*
Stroup, Steven L., 4,839,950, Cl. 29-157.30C.

Cruise, Thomas W.: *See—*
Burroughs, Dennis M.; and Cruise, Thomas W., 4,840,568, Cl. 439-49.000.

Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Roffinella, Daniele; and Sposini, Maurizio, 4,841,523, Cl. 370-89.000.

Cuculo, John A.; Theil, Michael H.; Yang, Kap S.; and Chen, Yue S., to North Carolina State University. Anisotropic cellulose articles, fibers, and films and method of producing same. 4,840,673, Cl. 106-198.000.

Culbertson, Billy M.; and Tiba, Omar, to Ashland Oil, Inc. Liquid aromatic bisoxazoline and disoxazine monomer mixtures cured with polyphenolic compounds. 4,841,002, Cl. 525-504.000.

Cummins, Richard F. Controlled wall casting process. 4,840,764, Cl. 264-102.000.

Cunningham, Timothy: *See—*
Linsky, Gary; Cunningham, Timothy; and Pines, Eli, 4,840,626, Cl. 604-364.000.

Curry, Sean: *See—*
Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, 4,841,455, Cl. 364-525.000.

Curtice-Burns, Inc.: *See—*
Meyer, Richard S.; Root, Jeffrey M.; Campbell, Michael L.; and Winter, Daryl B., 4,840,815, Cl. 426-611.000.

Curtis, Guy T., to TriTech Laboratories, Inc. Telephone network interface tester. 4,841,559, Cl. 379-27.000.

Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., to Boeing Company, The. Low temperature underaging process for lithium bearing alloys. 4,840,682, Cl. 148-12.70A.

Cuthbert, Roy M. Variable orifice flow meter. 4,840,072, Cl. 73-861.580.

Dahrendorf, Klaus-Dieter; Huennebeck, Volker; and Hoffman, Wilfried, to Auergesellschaft GmbH. Self-rescuer apparatus. 4,840,170, Cl. 128-202.260.

Dai Nippon Insatsu Kabushika Kaisha: *See—*
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-488.000.

Daicel Chemical Industries, Ltd.: *See—*
Izuka, Akihiro; Onizawa, Yoshio; and Yamashita, Mitsuru, 4,841,501, Cl. 369-13.000.
Murai, Takaaki; and Sakai, Katsuhisa, 4,841,017, Cl. 525-327.300.

Daido Tokushuko Kabushiki Kaisha: *See—*
Aoki, Hiroyuki; Yahagi, Shinichiro; and Saito, Takanobu, 4,840,073, Cl. 73-862.360.

Daiichi Seiyaku Co., Ltd.: *See—*
Kitagawa, Masayuki; and Tanaka, Makoto, 4,841,076, Cl. 549-401.000.

Daikin Industries Ltd.: *See—*
Shimizu, Tetsuo; and Hosokawa, Kazutaka, 4,840,998, Cl. 525-276.000.
Tamaru, Sinji; and Kubo, Motonobu, 4,841,005, Cl. 526-245.000.
Tamaru, Sinji; and Kubo, Motonobu, 4,841,093, Cl. 560-65.000.

Daikin Kogyo Co., Ltd.: *See—*
Fukui, Shosin; Shinjo, Masayoshi; and Aoyama, Hirokazu, 4,840,675, Cl. 106-38.220.

Daimler-Benz Aktiengesellschaft: *See—*
Freitag, Elmar; Weller, Karl-Heinz; and Trube, Hans-Wilhelm, 4,840,113, Cl. 98-2.000.
Herzog, Siegfried; Eckert, Dieter; and Bausch, Max, 4,840,475, Cl. 350-604.000.
Katz, Egon; Bossenmaier, Alban; and Barmbilla, Luigi, 4,840,397, Cl. 280-739.000.
Kotzab, Werner; and Zielke, Horst, 4,840,150, Cl. 123-90.390.
Lay, Kurt; and Sailer, Erwin, 4,840,551, Cl. 425-12.000.
Leiber, Heinz; and Ohnemuller, Hans-Joachim, 4,841,446, Cl. 364-426.020.
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Notz, Wolfgang; Schwarz, Volker; and Augustin, Ulrich, 4,840,060, Cl. 73-119.00A.
Peitsmeier, Karl; and Patzelt, Helmut, 4,840,386, Cl. 277-212.0FB.

Daimon, Hideo: *See—*
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.

Daiwa Seiko, Inc.: *See—*
Kaneko, Kyoichi, 4,840,327, Cl. 242-217.000.

Dalbey, Jeffrey C.: *See—*
Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., 4,840,635, Cl. 623-36.000.

Dalsat, Inc.: *See—*
Rose, Mark W., 4,841,305, Cl. 343-912.000.

Dambach, Philip J.: *See—*
Sampson, Stephen A.; Dambach, Philip J.; and Brunker, David L., 4,840,451, Cl. 350-96.200.

D'Ambra, Thomas E.; and Bell, Malcolm R., to Sterling Drug Inc. 4-arylcarbonyl-1-[(4-morpholinyl)-lower-alkyl]-1H-indoles. 4,840,950, Cl. 514-235.200.

Damji, Dhirendra, to Xerox Corporation. Process unit for an imaging apparatus. 4,841,333, Cl. 355-211.000.

Damp, James B. Fish scaling apparatus. 4,839,942, Cl. 17-64.000.

Dan, Shigeyuki: *See—*
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.

Dana-Farber Cancer Institute: *See—*
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

Daniel, Horst: *See—*
Nijhawan, Subash-Chander; Daniel, Horst; and Dennstedt, Welf, 4,840,857, Cl. 429-197.000.

Danley, Thomas J.; and Rey, Charles A., to Intersonics Incorporated. Horn loaded transducer for acoustic levitation. 4,841,495, Cl. 367-191.000.

Dansk Industri Syndikat A/S: *See—*
Jacobsen, Ole A., 4,840,416, Cl. 294-2.000.

Dargis, Daniel J.: *See—*
Rumbolt, Robin B.; Guerinot, William F.; and Dargis, Daniel J., 4,841,368, Cl. 358-194.100.

Data I/O Corporation: *See—*
Nierescher, David; and Yip, Douglas, 4,840,576, Cl. 439-331.000.

Dataproducts Corporation: *See—*
Wong, Kam C.; Rubinshtein, Bernard; and Arzoumanian, Aram, 4,840,501, Cl. 400-124.000.

Davidson, Bruce L.: *See—*
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,841,316, Cl. 354-4.000.

Davidson, Michel: *See—*
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, 4,840,783, Cl. 423-648.100.

Davis, Dwayne, to Emerson Electric Co. Explosion-proof fixture and method. 4,841,418, Cl. 362-223.000.

Davis Furniture Industries, Inc.: *See—*
Vogtherr, Burkhard; and Elzenbeck, Manfred, 4,840,426, Cl. 297-300.000.

Davis, Robert J., to Ferodo, Inc. Stairtread facings and a co-extrusion method for their manufacture. 4,840,824, Cl. 428-67.000.

Day, Kenneth C.: *See—*
Yagher, Charles, Jr.; and Day, Kenneth C., 4,841,274, Cl. 338-28.000.

Dayco Products, Inc.: *See—*
Wetzel, Robert E., 4,840,606, Cl. 474-153.000.

de la Bere, Imogen E.: *See—*
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

Deavenport, Dennis L.: *See—*
Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., 4,841,082, Cl. 556-129.000.

Debesis, John R., to Eastman Kodak Company. Holographic scanner spinner. 4,840,443, Cl. 350-3.710.

Debreczeni, Lorand: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Debrie, Jean-Jacques: *See—*
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.

Deere & Company: *See—*
Deutsch, Timothy A., 4,840,018, Cl. 56-12.300.
Nusbaum, David B.; and Mayfield, Robert L., 4,840,604, Cl. 464-176.000.
Oka, Ken K., 4,840,020, Cl. 56-15.200.

Deeslie, William D.: *See*—
Greenberg, Norman A.; Chandan, Ramesh C.; Deeslie, William D.; and Conolly, Daniel D., 4,840,813, Cl. 426-565.000.

Defrance, Andre; and Hauer, Jean-Claude, to Pont-A-Mousson S.A. Manhole assembly with T-shaped hinge. 4,840,514, Cl. 404-25.000.

Deguchi, Katsuhiko: *See*—
Shiozaki, Ryozi; Kaji, Atsuhiko; Saijo, Hiroyuki; and Deguchi, Katsuhiko, 4,840,746, Cl. 252-174.250.

Deis, Daniel W.: *See*—
Kemeny, George A.; and Deis, Daniel W., 4,841,181, Cl. 310-12.000.

Delaney, Robert H.; Kalmanek, Charles R., Jr.; and Restrick, Robert C., III, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Local area network with biasing arrangement for facilitating access contention between work stations connected to a common bus. 4,841,295, Cl. 340-825.500.

Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, to Societe Chimique des Charbonnages S.A. Catalytic process for the manufacture of acid fluoride. 4,840,750, Cl. 260-544.00A.

Delhomme, Georges: *See*—
Dittmar, Andre ; Delhomme, Georges; Roussel, Bernard; and Chatonnet, Joseph, 4,841,543, Cl. 374-44.000.

Della Bella, Davide; Carenzi, Angelo; Chiarino, Dario; and Pellacini, Franco, to Zambon S.p.A. Pharmaceutically useful derivatives of thiazolidine-4-carboxylic acid. 4,840,936, Cl. 514-18.000.

DeLong, Robert J.: *See*—
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 4,841,417, Cl. 362-206.000.

Delphax Systems: *See*—
Weiner, Nathan K., 4,841,313, Cl. 346-159.000.

DeLuca, Hector F.; Kutner, Andrzej; and Schnoes, Heinrich K., to Wisconsin Alumni Research Foundation. Method for preparing coenzyme a esters of all-trans- and 13-cis retinoic acids. 4,841,038, Cl. 536-27.000.

De Luca, Paul V.; and Neuwirth, Helmuth, to Porta Systems Corp. Telephone connector block having serially interconnectible grounding strip. 4,840,572, Cl. 439-92.000.

DeMaggio, Marina A.: *See*—
DiMaggio, Joseph T.; and DeMaggio, Marina A., 4,840,253, Cl. 186-49.000.

De Man, Erik; and Meier, Stefan, to Siemens Aktiengesellschaft. ECL-compatible input/output circuits in CMOS technology. 4,841,175, Cl. 307-475.000.

DeMar, Lawrence E.: *See*—
Lawlor, Patrick M.; and DeMar, Lawrence E., 4,840,375, Cl. 273-121.00A.

DeMejo, Lawrence P.: *See*—
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.

Demura, Shigeki; and Oura, Toshio, to NEC Corporation. Semiconductor memory device with address generator. 4,841,487, Cl. 365-230.010.

Denman, Stephen A., to Bloom, Jerome P., a part interest. Self balancing universal joint. 4,840,601, Cl. 464-157.000.

Dennison Manufacturing Company: *See*—
Pitts, Warren R., 4,840,406, Cl. 281-1.000.

Dennstedt, Welf: *See*—
Nijhawan, Subash-Chander; Daniel, Horst; and Dennstedt, Welf, 4,840,857, Cl. 429-197.000.

DePaul, Albert D., to Salzman, Robert S. Computer architecture providing programmable degrees of an almost condition. 4,841,473, Cl. 364-900.000.

de Raismes, John F.: *See*—
Osthus, Harold L.; de Raismes, John F.; Wolfson, Lawrence S.; and Vaida, Robert M., 4,840,123, Cl. 104-100.000.

Dermody, Nancy E.: *See*—
Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., 4,840,808, Cl. 426-270.000.

DeSoto, Inc.: *See*—
Sekmakas, Kazys, 4,840,991, Cl. 524-812.000.

Determann, Otto: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.

Deutsch, Timothy A., to Deere & Company. Lubrication distribution system for a cotton harvester. 4,840,018, Cl. 56-12.300.

Deutsche AG fur Unterhaltungeselectronic OHG: *See*—
Schiering, Rolf, 4,841,386, Cl. 360-69.000.

Deutsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Kallergis, Michael, 4,840,540, Cl. 416-223.00A.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Schodl, Richard, 4,840,486, Cl. 356-338.000.

Deutsche ITT Industries GmbH: *See*—
Gillies, David, 4,841,357, Cl. 358-17.000.
Mehrgardt, Soenke; and Ehret, Bernhard, 4,841,463, Cl. 364-724.160.

Deutsche Thomson-Brandt GmbH: *See*—
Hartmann, Uwe; and Ohnemus, Fritz, 4,841,251, Cl. 328-36.000.

Dewanckel, Bernard: *See*—
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.

Dewar, Robert; and Greer, Dale R., to Perceptron, Inc. Method and apparatus for calibrating a non-contact gauging sensor with respect to an external coordinate system. 4,841,460, Cl. 364-571.020.

De With, Gijsbertus; and Van Dijk, Hendricus J. A., to U.S. Philips Corporation. Discharge lamp having a yttrium aluminum garnet discharge envelope. 4,841,195, Cl. 313-636.000.

Deziel, Robert; and Endo, Masaki, to Bristol-Myers Company. Stereoselective synthesis of 1-β-alkyl carbapenem antibiotic intermediates. 4,841,043, Cl. 540-200.000.

Dhyanchand, P. John: *See*—
Dishner, Bryan W.; Maddali, Vijay K.; and Dhyanchand, P. John, 4,841,202, Cl. 318-14.000.

Diafoil Company, Limited: *See*—
Sakamoto, Seiji; and Yasumura, Kiyoshi, 4,840,830, Cl. 428-141.000.

Diamalt Aktiengesellschaft: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.

Diamond Products, Inc.: *See*—
Jedick, Andrew L., 4,840,431, Cl. 299-39.000.

Dias, Kenneth J.: *See*—
Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., 4,840,120, Cl. 101-228.000.

Diaz, Luis A.: *See*—
Yon, Steven A.; and Diaz, Luis A., 4,841,160, Cl. 307-66.000.

DiBianca, Frank A., to University of North Carolina at Chapel Hill. Continuous-resistance field shaping element for a kinestatic charge detector. 4,841,152, Cl. 250-374.000.

Diehl GmbH & Co.: *See*—
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, 4,841,493, Cl. 367-140.000.
Sundermeyer, Peter, 4,840,328, Cl. 244-3.150.

Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, to Bayer Aktiengesellschaft. Sulphonyliso(thio)urea derivatives and herbicidal use thereof. 4,840,661, Cl. 71-90.000.

Dieter, Monrow. Corner construction apparatus and method. 4,840,440, Cl. 312-140.000.

Dietrich, Rolf: *See*—
Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, 4,841,554, Cl. 378-57.000.

Dietzsch, Claudius R., to Sig Schweizerische Industrie-Gesellschaft. Device for transferring heat energy by capillary forces. 4,840,224, Cl. 165-104.260.

Digital Equipment Corporation: *See*—
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,840,225, Cl. 165-104.330.
Litt, Timothe, 4,840,567, Cl. 434-114.000.
Lonergan, Kevin J., 4,841,219, Cl. 323-274.000.

Digital Recording Research Limited Partnership: *See*—
Weaver, Charles S., 4,841,299, Cl. 341-65.000.

DiMaggio, Joseph T.; and DeMaggio, Marina A. Method and apparatus for serving and displaying food. 4,840,253, Cl. 186-49.000.

Dinneen, Maurice J., to Corporation of the City of Toronto, The. Vehicle for curbside collection of source separated recyclable materials. 4,840,531, Cl. 414-409.000.

di Salle, Enrico: *See*—
Buzzetti, Franco; di Salle, Enrico; and Lombardi, Paolo, 4,840,943, Cl. 514-177.000.

Di Schiena, Michele G.; and Orru, Vittoria, to Ricerche di Schiena S.n.c. del Dr. Michele G. di Schiena & C. Taurine derivative, its preparation and pharmaceutical composiions containing it. 4,840,964, Cl. 514-448.000.

Disco Abrasive Systems, Ltd.: *See*—
Sekiya, Shinji, 4,839,996, Cl. 51-281.00R.

Dishner, Bryan W.; Maddali, Vijay K.; and Dhyanchand, P. John, to Sundstrand Corporation. Speed-limited electrically compensated constant speed drive. 4,841,202, Cl. 318-14.000.

Disson, Arno: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Dittmar, Andre ; Delhomme, Georges; Roussel, Bernard; and Chatonnet, Joseph, to Centre National De La Recherche Scientifique (C.N.R.S.). Probe for measuring the thermal conductivity of materials. 4,841,543, Cl. 374-44.000.

Dobner, Reinhold, to G. M. Pfaff, AG. Apparatus for lighting a sewing area of a sewing machine. 4,841,415, Cl. 362-90.000.

Dr. Hans Heubach GmbH & Co. KG: *See*—
Gawol, Manfred; and Adrian, Gerhard, 4,840,668, Cl. 106-14.210.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Kolb, Eugen, 4,840,419, Cl. 296-108.000.
von Broock, Ulrich, 4,840,330, Cl. 244-17.270.

Dodge, David J., to Lange International S.A. Ski boot. 4,839,973, Cl. 36-121.000.

Dodiuk, Hanna, to State of Israel, Ministry of Defence, Armament Development Authorithy, Rafel. Triglycidyl ether/tetraglycidyl ether/alkadiene rubber/polyalkylene polyamine formulation. 4,841,010, Cl. 528-99.000.

Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, to Heimann GmbH. X-ray scanner for inspecting articles moving therethrough. 4,841,554, Cl. 378-57.000.

Doherty, Joseph P.; and Marek, James C., to United States of America, Energy. Precipitate hydrolysis process for the removal of organic compounds from nuclear waste slurries. 4,840,765, Cl. 376-310.000.

Dohogne, L. Ranney; and Heilman, Raymond D., to Emerson Electric Co. Dynamoelectric machine construction and method. 4,841,183, Cl. 310-90.000.

Doi, Kunio; and Kume, Yuichiro, to University of Chicago. Method and system for removing scatter and veiling glate and other artifacts in digital radiography. 4,841,555, Cl. 378-99.000.

Doke, Jack: *See*—
Clemens, Forrest E.; and Doke, Jack, 4,839,999, Cl. 52-36.000.

Dolgikh, Viktor A.: *See*—
Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M., 4,841,537, Cl. 372-55.000.

Doll, Ronald J.: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Domagala, John M.; Hagen, Susan E.; Sanchez, Joseph P.; and Solomon, Marjorie S., to Warner-Lambert Company. Novel disubstituted-7-pyrrolidinoquinoline antibacterial agents. 4,840,956, Cl. 514-312.000.

Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., to Babcock & Wilcox Company, The. Austenitic Fe-Cr-Ni alloy designed for oil country tubular products. 4,840,768, Cl. 420-582.000.

Dompe' Farmaceutici S.p.A.: *See*—
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.

Dong-Il, Song, to Samsung Electronics Co., Ltd. High speed comparator circuit with single supply voltage. 4,841,171, Cl. 307-355.000.

Doom, Harvey A. Locking hitch pin assembly. 4,840,528, Cl. 411-351.000.

Dorsch, Glenn R., to Vaughan Co., Inc. Face-type shaft seal with shroud. 4,840,384, Cl. 277-12.000.

Doss, Todd. Solar charging lamp. 4,841,416, Cl. 362-183.000.

Doteuchi, Masami: *See*—
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, 4,840,953, Cl. 514-258.000.

Dougherty, Lawrence W.; and Kraner, James L., to Zenith Electronics Corporation. Factory fixture frame with means for temporarily and removably supporting an in-process tension mask for a color cathode ray tube. 4,840,596, Cl. 445-30.000.

Doughty, Robert E. Grocery cart. 4,840,388, Cl. 280-33.994.

Doumani, George: *See*—
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,840,225, Cl. 165-104.330.

Douwe Egberts Koninklijke Tabaks-fabriek-Koffiebranderijen-Theehandel N.V.: *See*—
Henriquez, Percy C., 4,840,737, Cl. 210-772.000.

Dow Chemical Company, The: *See*—
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-16.000.
Clark, Howard W.; and Chapman, Tracy E., 4,840,676, Cl. 106-462.000.

Dow Corning Corporation: *See*—
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., 4,840,796, Cl. 424-448.000.
Vincent, Gary A., 4,840,983, Cl. 524-265.000.

Dow Corning, Ltd.: *See*—
Gardiner, William, 4,840,743, Cl. 252-49.600.

Dow Corning Wright: *See*—
Sasaki, Gordon H., 4,840,190, Cl. 128-897.000.

Downing, John P., Jr. Optical backscatter turbidimeter sensor. 4,841,157, Cl. 250-574.000.

Draegerwerk AG: *See*—
Schmidt, Wolf-Dieter, 4,840,227, Cl. 165-162.000.

Dragerwerk Aktiengesellschaft: *See*—
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, 4,840,171, Cl. 128-204.180.

Drent, Eit, to Shell Oil Company. Catalytic polymerization of carbon monoxide with functional substituted ethylenically unsaturated monomer. 4,841,020, Cl. 528-392.000.

Drevfors, Gunnar; Corniea, Donald G.; and Paulson, Norman J., to Tetra Pak Finance & Trading S.A. Method and apparatus for dispensing liquids. 4,840,205, Cl. 141-2.000.

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Unland, Georg; and Driemeier, Gunter, 4,840,561, Cl. 432-106.000.

Driga, Mircea D.: *See*—
Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., 4,841,217, Cl. 322-8.000.

Dubost, Bruno, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Al-Cu-Li-Mg alloys with very high specific mechanical strength. 4,840,683, Cl. 148-12.70A.

Dubrul, William R.: *See*—
Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,840,615, Cl. 604-93.000.

Dubur, Gunar Y.: *See*—
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.

Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, to Siemens Aktiengesellschaft. Truncated cone shaped surface resonator for nuclear magnetic resonance tomography. 4,841,249, Cl. 324-318.000.

Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., to Therapeutic Systems, Inc. Buoyant support apparatus and system for use in exercising. 4,840,591, Cl. 441-106.000.

Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, to Alsthom. Device for ventilating rheostats and/or fluid radiators in a locomotive. 4,840,221, Cl. 165-41.000.

Dunton, Arthur R., to Insulator Seal, Inc. High power radio frequency energy feedthrough for high vacuum vessel. 4,841,098, Cl. 174-15.300.

Du Pont de Nemours, E. I., and Company: *See*—
Benim, Thomas E., 4,840,695, Cl. 156-344.000.
Smiley, Robert A., 4,841,092, Cl. 558-455.000.
Wyss, Kurt H., 4,840,838, Cl. 428-234.000.

Duracell Inc.: *See*—
Chalilpoyil, Purush; Parsen, Frank E.; and Wang, Chih-Chung, 4,840,644, Cl. 29-623.100.

Durand, Daniel: *See*—
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, 4,840,783, Cl. 423-648.100.

Durham, Roger O. Freewheel mechanism for bicycles. 4,840,084, Cl. 74-594.100.

Dutois, Franck: *See*—
Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, 4,840,442, Cl. 350-1.600.

Dwan, William E.: *See*—
Caputo, Garry L.; Saldarelli, Thomas A.; and Dwan, William E., 4,840,270, Cl. 206-205.000.

Dyneer Corporation: *See*—
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., 4,840,607, Cl. 474-167.000.

Dzodin, Milton A. Silver recovery cell. 4,840,717, Cl. 204-237.000.

E. I. Du Pont Nemours and Company: *See*—
Ebersole, Richard C.; and Foss, Robert P., 4,840,756, Cl. 264-22.000.

E.P. Barrus Limited: *See*—
Glen, Robert D., 4,840,752, Cl. 261-72.100.

Eastman Kodak Company: *See*—
Barbee, Robert B., 4,841,012, Cl. 528-125.000.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.
Debesis, John R., 4,840,443, Cl. 350-3.710.
Frank, David S.; and Belly, Robert T., 4,840,784, Cl. 424-3.000.
Guslits, Vladimir S.; and Bailey, Steven P., 4,840,259, Cl. 192-48.200.
Hansen, David E., 4,841,319, Cl. 354-275.000.
Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., 4,840,898, Cl. 435-87.000.
Mooberry, Jared B.; and Singer, Stephen P., 4,840,884, Cl. 430-557.000.
Pochodylo, James M., 4,840,899, Cl. 435-87.000.
Sheu, Yea-Dean, 4,840,917, Cl. 437-10.000.
Sheu, Yea-Dean; and Hawkins, Gilbert, 4,840,918, Cl. 437-53.000.
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,860, Cl. 430-59.000.
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,861, Cl. 430-59.000.

Eaton Corporation: *See*—
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.
Juds, Mark A.; and Beihoff, Bruce C., 4,841,246, Cl. 324-208.000.

Ebersole, Richard C.; and Foss, Robert P., to E. I. Du Pont Nemours and Company. Radiation process for preparation of electrophoresis gel material. 4,840,756, Cl. 264-22.000.

Eccleston, Larry E., to John Fluke Mfg. Co., Inc. Temperature controlled hybrid assembly. 4,841,170, Cl. 307-310.000.

Eccleston, Larry E., to John Fluke Mfg. Co., Inc. Method of and circuit for ohmmeter calibration. 4,841,229, Cl. 324-63.000.

Echosphere Corporation: *See*—
Burr, James D., 4,841,309, Cl. 343-766.000.

Ecia - Equipements et Composants pour L'Industrie Automobile: *See*—
Escaravage, Gerard, 4,840,403, Cl. 280-808.000.

Eckart, Donald W.: *See*—
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.

Eckart, George R.: *See*—
Baggio, Horacio A.; and Eckart, George R., 4,841,420, Cl. 362-249.000.

Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,840,161, Cl. 123-500.000.

Eckert, Dieter: *See*—
Herzog, Siegfried; Eckert, Dieter; and Bausch, Max, 4,840,475, Cl. 350-604.000.

Eckert, Gerold: *See*—
Bauer, Karl-Heinz; and Eckert, Gerold, 4,840,114, Cl. 98-2.000.

Edamura, Kaoru, to Sharp Kabushiki Kaisha. Control unit for a heating system with memory means. 4,841,125, Cl. 219-506.000.

Edelstein, William A.; and Schenck, Frederick, to General Electric Company. Current streamline method for coil construction. 4,840,700, Cl. 156-634.000.

Edwards, Bill R. Polyester resin compositions. 4,841,016, Cl. 528-272.000.

Effland, Joseph T.: *See*—
Effland, Richard C.; and Effland, Joseph T., 4,840,972, Cl. 514-313.000.

Effland, Richard C.; and Effland, Joseph T., to Hoechst-Roussel Pharmaceuticals, Inc. Relief from memory dysfunction with α-alkyl-4-amino-3-quinolinemethanols and 1-(4-aralkylamino-3-quinolinyl)alkanones and related compounds. 4,840,972, Cl. 514-313.000.

Egan, Walter D.: *See*—
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., 4,840,671, Cl. 106-85.000.

Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, to Pfizer Inc. Benzopyrans. 4,841,078, Cl. 549-402.000.

EGIS Gyogyszergyar: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Ehrenhalt, Dan; and Giles, George R., to LTV Aerospace & Defense Co. Method for packaging a microwave tube modulator. 4,841,258, Cl. 332-9.00R.

Ehresmann, Walter: *See*—
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, 4,841,280, Cl. 340-706.000.

Ehret, Bernhard: *See*—
Mehrgardt, Soenke; and Ehret, Bernhard, 4,841,463, Cl. 364-724.160.

Ehrgott, Frederick J., Jr.: *See*—
Glamkowski, Edward J.; Chiang, Yulin; and Ehrgott, Frederick J., Jr., 4,840,947, Cl. 514-219.000.

Eica-Equipements et Composants Pour L'Industrie Automobile: *See*—
Escaravage, Girard, 4,840,405, Cl. 280-808.000.

Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., to Texas Alkyls, Inc. Preparation of dimethylzinc. 4,841,082, Cl. 556-129.000.

Eilender, Albert: *See*—
Gagiani, Kamlesh; and Eilender, Albert, 4,841,064, Cl. 548-215.000.

Eisai Co., Ltd.: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Ejima, Shozo; Sugihara, Taizo; and Abe, Morio, to Chisso Corporation. Heat-adhesive composite fibers and method for making the same. 4,840,846, Cl. 428-373.000.

Ejiri, Takashi: *See*—
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Elam, Dennis C. Handcuff restraining apparatus and method of use. 4,840,048, Cl. 70-16.000.

Elco Industries, Inc.: *See*—
Hagan, Robert A.; and Reinwall, Ernest W., 4,840,083, Cl. 74-574.000.

Eleanor Roosevelt Institute for Cancer Research, Inc.: *See*—
Anderson, David W., 4,840,934, Cl. 514-2.000.

Electric Power Research Institute, Inc.: *See*—
Youd, T. Leslie; and Jackson, Garrett O., 4,840,230, Cl. 166-382.000.

Electronic Instrumentation and Technology, Inc.: *See*—
May, Joe T.; and Casacia, Edward A., 4,841,156, Cl. 250-461.100.

Elekes, Istvan: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Elleman, Daniel D.; Allen, James L.; and Lee, Mark C., to United States of America, National Aeronautics and Space Administration. Non-contact temperature pattern measuring device. 4,840,496, Cl. 374-124.000.

Ellerbrock, Donald H.: *See*—
Fait, Roger J.; and Ellerbrock, Donald H., 4,840,289, Cl. 220-359.000.

Ellington, William E.: *See*—
Matza, Stephen D.; Ellington, William E.; and Fleming, Henry C., III, 4,840,910, Cl. 436-30.000.

Ellis, Roy J. Blow plug. 4,840,352, Cl. 254-134.400.

Elmer, William A. Lighting system for car top sign. 4,839,975, Cl. 40-592.000.

Elsaesser, Andreas; and Rode, Klaus, to Hoechst Aktiengesellschaft. Positive-working radiation-sensitive recording material with radiation-sensitive 1,2-quinone diazide underlayer and thicker positive-working radiation-sensitive overlayer. 4,840,867, Cl. 430-156.000.

Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, to U.S. Philips Corporation. Electromagnetic shielding arrangement. 4,841,102, Cl. 174-35.0GC.

ELTI Apparatebau und Elektronik GmbH: *See*—
Kuehnert, Hans-Guenter E., 4,840,698, Cl. 156-485.000.

Elzenbeck, Manfred: *See*—
Vogtherr, Burkhard; and Elzenbeck, Manfred, 4,840,426, Cl. 297-300.000.

Ema, Hideaki: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.

Embry, James: *See*—
Foti, Michael; and Embry, James, 4,840,855, Cl. 429-120.000.

Emerson Electric Co.: *See*—
Davis, Dwayne, 4,841,418, Cl. 362-223.000.
Dohogne, L. Ranney; and Heilman, Raymond D., 4,841,183, Cl. 310-90.000.

Emhart Industries, Inc.: *See*—
Adams, George W.; Smock, Steven W.; and Helft, Ross G., 4,841,496, Cl. 368-107.000.
Amonett, Daniel K., 4,841,110, Cl. 200-574.000.

Emori, Hiroshi: *See*—
Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, 4,841,144, Cl. 250-239.000.

Emory University: *See*—
Chu, Chung K.; and Schinazi, Raymond F., 4,841,039, Cl. 536-29.000.

Emura, Noriaki: *See*—
Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, 4,840,986, Cl. 524-436.000.

Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, to Kyocera Corporation. Synchronous tracking device for direct spread spectrum receiver. 4,841,545, Cl. 375-1.000.

Endo, Fumio: *See*—
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.

Endo, Masaki: *See*—
Deziel, Robert; and Endo, Masaki, 4,841,043, Cl. 540-200.000.

Endo, Masayuki; Sasago, Masaru; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Pattern forming method by use of X-ray exposure. 4,840,872, Cl. 430-273.000.

Endo, Masayuki: *See*—
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, 4,841,341, Cl. 355-43.000.

Endo, Takeshi; Nambu, Yoko; and Yamamoto, Kazutoshi, to Asahi Denka Kogyo Kabushiki Kaisha. Viologen derivative. 4,841,058, Cl. 546-257.000.

Endo, Tetsuo: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.

Engel, Jurgen; and Scheffler, Gerhard, to Aasta Pharma AG. 4-benzyl-1-(2H)-phthalazinone-derivates. 4,841,047, Cl. 540-599.000.

Engel, Thomas H. Trailer air grill. 4,840,422, Cl. 296-180.400.

Enterprises International, Inc.: *See*—
Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., 4,840,008, Cl. 53-137.000.

Enthone, Incorporated: *See*—
Schultz, Paul B.; and Yarkosky, Eugene F., 4,840,820, Cl. 427-305.000.

Epsco, Incorporated: *See*—
Call, William F., 4,841,260, Cl. 333-21.00A.

Epstein, Arthur J.; Ewing, Joan R.; and Swift, Joseph A., to Xerox Corporation. Electrically insulating polymer matrix with conductive path formed in situ. 4,841,099, Cl. 174-68.500.

Epstein, Joseph; Parsons, John A.; and Block, Frank, to United States of America, Army. Use of sulfoxides for testing ionization detector system. 4,840,911, Cl. 436-8.000.

Erchak, Nikolai P.: *See*—
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.

Erdman, Timothy R.: *See*—
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,840,744, Cl. 252-51.50A.

Erez Forensic Technology, Ltd.: *See*—
Glattstein, Baruch, 4,840,912, Cl. 436-92.000.

Ernst, Richard J., to Illinois Tool Works Inc. Adjustable dispensing tool. 4,840,294, Cl. 222-287.000.

Esaki, Hiroshi: *See*—
Kajita, Ryota; Esaki, Hiroshi; and Shimazaki, Hirato, 4,840,380, Cl. 273-77.00A.

Escaravage, Gerard, to Ecia - Equipements et Composants pour L'Industrie Automobile. Device for adjusting the position of a strap return element, in particular of a safety belt for an automobile vehicle. 4,840,403, Cl. 280-808.000.

Escaravage, Girard, to Eica-Equipements et Composants Pour L'Industrie Automobile. Mechanism for maintaining a strap of a safety belt in an adjustable position. 4,840,405, Cl. 280-808.000.

Esge-Marby GmbH & Co., KG: *See*—
Belka, Heinrich, 4,840,298, Cl. 224-39.000.

Eskilsson, Eva C.: *See*—
Appelgren, Curt H.; Eskilsson, Eva C.; and Uvdal, Jonas P., 4,840,799, Cl. 424-493.000.

Etablissements Maurice Maillard: *See*—
Josereau, Bernard, 4,840,260, Cl. 192-64.000.

ETA SA Fabriques d'Ebauches: *See*—
Zaugg, Hans, 4,840,337, Cl. 248-115.000.

Etabilissement Public dit "Telediffusion de France": *See*—
Vigarie, Jean-Pierre; Carlach, Jean-Claude; and Penard, Pierre, 4,841,462, Cl. 364-723.000.

Etani, Tadao: *See*—
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.

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Vigarie, Jean-Pierre; Carlach, Jean-Claude; and Penard, Pierre, 4,841,462, Cl. 364-723.000.

Etat Francais represente par le Ministre Delegue des Postes et Telecommunications (CNET): *See—*
Mulawka, Jan; Konczykowska, Agnieszka; and Bon, Michel, 4,841,263, Cl. 333-173.000.

Etat Francais Represente Par Le Ministre des Postes et Telecommunications-Centre National D'Etudes des Telecommunications: *See—*
Thiennot, Jean, 4,840,448, Cl. 350-96.160.

Eue, Ludwig: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

European Atomic Energy Community (Euratom): *See—*
Mills, Simon F., 4,840,574, Cl. 439-191.000.

Eusepi, Martin W.: *See—*
Chen, Hsiang M.; Eusepi, Martin W.; and Johnson, Robert E., 4,841,184, Cl. 310-90.500.

Evans, Richard, III. Pet portal. 4,840,217, Cl. 160-368.100.

Evans, Vernon C.; and Heidinger, George H., to Peabody Coal Company. Switching and testing system. 4,841,159, Cl. 307-38.000.

Ewing, Joan R.: *See—*
Epstein, Arthur J.; Ewing, Joan R.; and Swift, Joseph A., 4,841,099, Cl. 174-68.500.

Extrusion Punch & Tool Co.: *See—*
Reilly, Bernard J.; and Michels, Roger, 4,840,556, Cl. 425-543.000.

Exxon Research and Engineering Company: *See—*
Beltzer, Morton; and Jahanmir, Said, 4,840,741, Cl. 252-47.000.

Eyraud, Marcel, to Rhone-Poulenc Films. Stretched, composite polyester films usable particularly for graphic arts. 4,840,836, Cl. 428-213.000.

Fahlstroem, Ulf: *See—*
Lekholm, Anders; Fahlstroem, Ulf; and Groothoff, Hermann, 4,840,186, Cl. 128-784.000.

Faiola, Michael S.; and Faiola, Richard J. Greeting card and package. 4,840,275, Cl. 206-423.000.

Faiola, Richard J.: *See—*
Faiola, Michael S.; and Faiola, Richard J., 4,840,275, Cl. 206-423.000.

Fait, Roger J.; and Ellerbrock, Donald H., to Sonoco Products Company. Spin-bonded all plastic can and method of forming same. 4,840,289, Cl. 220-359.000.

Falterman, Wesley E. Seat belt system having shoulder height support. 4,840,404, Cl. 280-808.000.

Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., to GTE Products Corporation. Method for producing a terbium activated cerium magnesium aluminate phosphor. 4,840,747, Cl. 252-301.40R.

Fanuc Ltd.: *See—*
Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, 4,841,432, Cl. 364-191.000.
Neko, Noriaki, 4,841,211, Cl. 318-569.000.

Farhangi, Hassan; and Konings, Johan W. M. E., to U.S. Philips Corporation. Sequential buffer device. 4,841,513, Cl. 369-59.000.

Farmitalia Carlo Ebra S.r.l.: *See—*
Buzzetti, Franco; di Salle, Enrico; and Lombardi, Paolo, 4,840,943, Cl. 514-177.000.

Farmitalia Carlo Erba s.r.l.: *See—*
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.

Farquhar, David; and Wang, Yuqiang, to Board of Regents, University of Texas System. Aldophosphamides. 4,841,085, Cl. 538-180.000.

Fasco Industries, Inc.: *See—*
Lakin, Bryan L.; and McDaniel, William P. W., 4,840,222, Cl. 165-47.000.

Fattori, Joseph E.; and Wagner, Siegbert O., to Mennen Company, The. Elongated roll-on applicator package with resilient liner. 4,840,511, Cl. 401-213.000.

Faucher, Joseph A., to UOP. Process for inhibiting mono and diethanolamine degradation. 4,840,777, Cl. 423-229.000.

Fauconet, Michel: *See—*
Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, 4,840,750, Cl. 260-544.00A.

FBK International Corporation: *See—*
Quackenbush, John, 4,840,623, Cl. 604-280.000.

Feay, Darrell C.: *See—*
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-16.000.

Fedele, Brian: *See—*
Liberman, Barnet L., 4,840,034, Cl. 62-64.000.
Liberman, Barnet L., 4,840,035, Cl. 62-64.000.

Fedele, Joseph: *See—*
Liberman, Barnet L., 4,840,034, Cl. 62-64.000.
Liberman, Barnet L., 4,840,035, Cl. 62-64.000.

Federmann, Helmut; Levacher, Friedrich K.; and Noack, Georg, to Felten & Guilleaume Energietechnik GmbH. Light wave conductor-sensor for tension. 4,840,452, Cl. 350-96.230.

Federmann, Helmut: *See—*
Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, 4,840,480, Cl. 356-32.000.

Feigel, Josef; and Pfendler, Klaus, to Standard Elektrik Lorenz Aktiengesellschaft. Electronically commutated, collectorless directed-current motor. 4,841,186, Cl. 310-156.000.

Feldmuhle Aktiengesellschaft: *See—*
Fingerle, Dieter; and Gundel, Wolf-Dieter, 4,840,154, Cl. 123-193.00H.

Felten & Guilleaume Energietechnik GmbH: *See—*
Federmann, Helmut; Levacher, Friedrich K.; and Noack, Georg, 4,840,452, Cl. 350-96.230.

Fenn, Brian A.: *See—*
Welsh, William J.; Fenn, Brian A.; and Challener, Paul, 4,841,575, Cl. 381-36.000.

Ferber, Hubert P.: *See—*
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,841,065, Cl. 548-238.000.

Ferguson, Edward H. F.: *See—*
Neil, Gary A.; and Ferguson, Edward H. F., 4,840,345, Cl. 248-74.200.

Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., to Pulse Electronics, Inc. Fuel measuring system. 4,840,056, Cl. 73-1.00H.

Ferodo, Inc.: *See—*
Davis, Robert J., 4,840,824, Cl. 428-67.000.

Fest, Christa: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, to VEB Forschung und Entwicklung. Electrically conductive two component twisted yarn and fabrics for textile flat goods for clean rooms and clean room wearing apparel. 4,840,202, Cl. 139-425.00R.

Field, Martha M.: *See—*
Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., 4,840,635, Cl. 623-36.000.

Fields, John G.: *See—*
Saunders, Anne L.; and Fields, John G., 4,839,984, Cl. 43-112.000.

Fingerle, Dieter; and Gundel, Wolf-Dieter, to Feldmuhle Aktiengesellschaft. Tubular ceramic body for gas passages in cylinder head of internal combustion engine. 4,840,154, Cl. 123-193.00H.

Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., to International Business Machines Corporation. Multidirectional scan and print capability. 4,841,453, Cl. 364-519.000.

Fiori, David, Jr., to Sensor Technologies, Inc. Displacement sensor having multiplexed dual tank circuits. 4,841,245, Cl. 324-208.000.

Fioroli, Mario: *See—*
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.

Fischer, Helmut, to Rheinmetall GmbH. Device for storing and loading ammunition in a turret. 4,840,110, Cl. 89-46.000.

Fisher & Paykel: *See—*
Cheyne, Neil G., 4,841,207, Cl. 388-811.000.

Fitzky, Hans G.: *See—*
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.

Flagello, Donis G.; Wilczynski, Janusz S.; and Witman, David F., to International Business Machine Corporation. Simultaneous multiple level interconnection process. 4,840,923, Cl. 437-189.000.

Fleisch, Eugen: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Fleiss, Hartmut W.: *See—*
Novak, Frank; and Fleiss, Hartmut W., 4,841,123, Cl. 219-125.120.

Fleming, Henry C., III: *See—*
Matza, Stephen D.; Ellington, William E.; and Fleming, Henry C., III, 4,840,910, Cl. 436-30.000.

Flexi-Coil Limited: *See—*
Friggstad, Terrance; and Hundeby, David R., 4,840,233, Cl. 172-311.000.

Flig, Alan Y.; and Regan, Paul. Earthquake utilities cut-off control system. 4,841,287, Cl. 340-690.000.

Flight Dynamics, Inc.: *See—*
Ford, Douglas W., 4,841,448, Cl. 364-433.000.

Florence, Robert A.: *See—*
Campbell, John R.; Williams, Robert E., Jr.; Brown, Sterling B.; Conroy, Paul M.; and Florence, Robert A., 4,840,982, Cl. 524-151.000.

Fluhrer, Henry: *See—*
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, 4,841,493, Cl. 367-140.000.

Fluid Regulators Corp.: *See—*
Hribar, Frank, 4,840,031, Cl. 60-338.000.

Flynn, Nigel; and Clark, Nigel, to Lantor (UK) Limited. Composite material. 4,840,840, Cl. 428-283.000.

FMC Corporation: *See—*
Rentmeester, Alan L.; and Pamperin, John M., 4,840,009, Cl. 53-373.000.
Tomasek, Jaroslav, 4,841,213, Cl. 318-661.000.
Vijay, Tumkur R.; and Mannen, Bryce L., 4,840,215, Cl. 157-1.000.

Focke & Co. (GMBH & Co.): *See—*
Focke, Heinz; and Liedtke, Kurt, 4,840,007, Cl. 53-137.000.
Focke, Heinz; and Bretthauer, Hans Jurgen, 4,840,010, Cl. 53-375.000.
Focke, Heinz; and Liedtke, Kurt, 4,840,321, Cl. 242-58.600.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GMBH & Co.). Packaging machine with a drying turret. 4,840,007, Cl. 53-137.000.

Focke, Heinz; and Bretthauer, Hans Jurgen, to Focke & Co. (GmbH & Co.). Device for actuation of sealing jaws of a packaging machine. 4,840,010, Cl. 53-375.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Apparatus for feeding packaging-material reels to a packaging machine. 4,840,321, Cl. 242-58.600.
Fodale, Robert: *See*—
Hampton, Herbert R.; Fodale, Robert; and Conkling, Charles R., Jr., 4,840,069, Cl. 73-802.000.
Foell, Helmut; and Lehmann, Volker, to Siemens Aktiengesellschaft. Method and measuring instrument for identifying the diffusion length of the minority charge carriers for non-destructive detection of flaws and impurities in semiconductor crystal bodies. 4,841,239, Cl. 324-158.00R.
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, to Digital Equipment Corporation. Heat exchange element and enclosure incorporating same. 4,840,225, Cl. 165-104.330.
Folsom, Fred. Ventilation system for artists. 4,840,169, Cl. 128-863.000.
Fonticoli, Alfredo R. Machine for the production of puffed cereals. 4,840,117, Cl. 99-323.400.
Ford, Douglas W., to Flight Dynamics, Inc. Windshear flight recovery command system. 4,841,448, Cl. 364-433.000.
Ford, Keith L. Grease fitting for dog. 4,840,414, Cl. 292-356.000.
Ford Motor Company: *See*—
Logothetis, Eleftherios M.; and Soltis, Richard E., 4,840,913, Cl. 436-116.000.
Orlando, James A., 4,839,941, Cl. 16-361.000.
Siegl, Walter O.; and Chattha, Mohinder S., 4,840,667, Cl. 106-14.150.
Foreman, Robert W. Mixture and method for preparing casting cores and cores prepared thereby. 4,840,219, Cl. 164-369.000.
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., to Mobil Oil Corporation. Holding arrangement for loading plastic bags. 4,840,335, Cl. 248-97.000.
Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., to Lubrizol Corporation, The. Explosive compositions. 4,840,687, Cl. 149-2.000.
Foseco International Limited: *See*—
Hartley, James F. M., 4,840,295, Cl. 222-598.000.
Meumann, Henry R.; and Stark, Johannes, 4,840,131, Cl. 110-336.000.
Foss, Robert P.: *See*—
Ebersole, Richard C.; and Foss, Robert P., 4,840,756, Cl. 264-22.000.
Foti, Michael; and Embry, James. Battery life extender. 4,840,855, Cl. 429-120.000.
Four Paws Products, Ltd.: *See*—
Simon, Allen, 4,840,143, Cl. 119-52.00R.
Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; and Fourcadier, Chantal, 4,840,790, Cl. 424-70.000.
Fox, Daniel W.; Peters, Edward N.; and Sybert, Paul D., to General Electric Company. Low plate-out polycarbonate end capped with phenoxy acetic acid. 4,841,015, Cl. 528-198.000.
Framatome: *See*—
Bonnet, Bernard, 4,840,521, Cl. 411-14.000.
Boula, Gerard; and Georges, Alain, 4,839,951, Cl. 29-157.400.
Bourdonne, Jean-Claude, 4,840,526, Cl. 411-263.000.
Framatome & Cie.: *See*—
Martin, Alain; and Maillard, Philippe, 4,840,096, Cl. 82-113.000.
Francois, Marc: *See*—
Guevel, Jean; Francois, Marc; and Bontemps, Guy, 4,840,021, Cl. 57-210.000.
Francotyp-Postalia GmbH: *See*—
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, 4,840,367, Cl. 271-160.000.
Frank, David S.; and Belly, Robert T., to Eastman Kodak Company. Use of pyrylium and thiapyrylium compounds as biological stains. 4,840,784, Cl. 424-3.000.
Franz, John E., to Monsanto Company. N-Phosphonomethylglycine phytotoxicant compositions. 4,840,659, Cl. 71-86.000.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.
Fraunhofer Geselschaft E.V.: *See*—
Bauser, Herbert; Schindler, Bernd; and Chmiel, Horst, 4,840,636, Cl. 8-115.520.
Fredrikseon, Lars-Berno, to Kvaser Consultant, AB. Arrangement comprising a system providing movement, processing and/or production. 4,841,450, Cl. 364-468.000.
Freeman, Gerard L.: *See*—
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.
Freese, James S., to Mirafi, Inc. Subterranean drain. 4,840,515, Cl. 405-45.000.
Freitag, Douglas W., to LTV Aerospace and Defense Company. Method for the production of reinforced composites. 4,840,763, Cl. 264-65.000.
Freitag, Elmar; Weller, Karl-Heinz; and Trube, Hans-Wilhelm, to Daimler-Benz Aktiengesellschaft. Louver vent for the ventilation of a motor vehicle passenger compartment. 4,840,113, Cl. 98-2.000.
Fremont, Owen K.: *See*—
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,839,958, Cl. 29-450.000.
Frick Company: *See*—
Garland, Milton W., 4,840,033, Cl. 62-59.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Hirschkorn, Ingo, 4,840,554, Cl. 425-190.000.
Friggstad, Terrance; and Hundeby, David R., to Flexi-Coil Limited. Agricultural implement having rock shaft actuated transport wheel frames. 4,840,233, Cl. 172-311.000.
Frotscher, Guenter: *See*—
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.
Fry, Emanuel D., to Tecumseh Products Company. Compressor including protective cap for hermetic terminal. 4,840,547, Cl. 417-422.000.
Fuchigami, Wataru: *See*—
Sakurai, Tadashi; and Fuchigami, Wataru, 4,840,029, Cl. 60-313.000.
Fudim, Efrem V., to Sundstrand Corp. Liquid volume monitoring apparatus and method. 4,840,064, Cl. 73-290.00B.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.
Fuji Photo Film Co., Ltd.: *See*—
Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, 4,840,877, Cl. 430-350.000.
Chikamasa, Hiroshi; Utsui, Masaaki; and Nojiri, Yasutami, 4,840,818, Cl. 427-130.000.
Goto, Chiaki; and Horikawa, Kazuo, 4,841,135, Cl. 350-6.800.
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, 4,840,326, Cl. 242-199.000.
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Kose, Junichi; and Seto, Nobuyuki, 4,841,321, Cl. 354-324.000.
Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, 4,840,875, Cl. 430-309.000.
Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, 4,840,862, Cl. 430-75.000.
Mizuta, Akira, 4,839,953, Cl. 29-225.000.
Nakamura, Koki, 4,840,887, Cl. 430-564.000.
Nishiyama, Mikio; Yoshino, Tatsuo; and Akimoto, Taizo, 4,841,371, Cl. 358-244.000.
Oishi, Kengo, 4,840,760, Cl. 264-245.000.
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.
Sano, Shojiro; and Saeki, Keiso, 4,840,927, Cl. 503-201.000.
Saotome, Shigeru, 4,841,147, Cl. 250-327.200.
Sasaki, Akihiko; and Atsumi, Hiroaki, 4,841,382, Cl. 360-32.000.
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.
Shizukuishi, Makoto; and Kondo, Ryuji, 4,841,348, Cl. 357-30.000.
Takahashi, Motoaki, 4,840,369, Cl. 271-276.000.
Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, 4,841,320, Cl. 354-299.000.
Takimoto, Masaaki, 4,841,293, Cl. 340-763.000.
Taniguchi, Isao, 4,841,339, Cl. 355-27.000.
Tokuda, Kanji, 4,841,340, Cl. 355-38.000.
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.
Urabe, Hitoshi; Shigaki, Takao; and Shimazaki, Osamu, 4,841,362, Cl. 358-80.000.
Usami, Toshimasa; Hatakeyama, Seiji; and Shimomura, Akihiro, 4,840,933, Cl. 503-213.000.
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Suzuki, Masami; and Yamada, Yasuyuki, 4,840,842, Cl. 428-323.000.
Fuji Xerox Co., Ltd.: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, to Kawasaki Steel Corporation. Method and apparatus for cutting and welding steel strips. 4,840,303, Cl. 228-164.000.
Fujii, Satoshi, to Sumitomo Electric Industries, Ltd. Wear-resistant sintered iron-based alloy and process for producing the same. 4,840,665, Cl. 75-241.000.
Fujii, Yasushi: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, to Nissan Chemical Industries, Ltd. 3-hydroxy pyrazole derivatives. 4,841,068, Cl. 548-365.000.
Fujikura Kasei Co., Ltd.: *See*—
Otsu, Akira; and Nagase, Hiroshi, 4,840,863, Cl. 430-110.000.
Fujikura Ltd.: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.
Fujikura Rubber, Ltd.: *See*—
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.
Fujimagari, Hiroshi: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Fujimura, Setsuo; Sagawa, Masato; and Matsuura, Yutaka, to Sumitomo Special Metals Co, Ltd. Isotropic permanent magnets and process for producing same. 4,840,684, Cl. 148-302.000.

Fujimura, Takashi: *See*—
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.
Fujimura, Yoshihiko: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Fujisawa Pharmaceutical Company, Limited: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,841,062, Cl. 548-194.000.
Fujisu Limited: *See*—
Masuko, Takayuki; Suzuki, Norio; and Moriya, Kaoru, 4,839,993, Cl. 51-129.000.
Fujita, Akihiko: *See*—
Oikawa, Ryuetsu; and Fujita, Akihiko, 4,839,937, Cl. 16-2.000.
Fujita, Hiroya, to Toyota Jidosha Kabushiki Kaisha. Camshaft apparatus for an internal combustion engine. 4,840,149, Cl. 123-90.310.
Fujita, Shigeru: *See*—
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.
Fujita, Shinichi, to Yamaha Corporation. Stereophonic signal processing circuit. 4,841,573, Cl. 381-27.000.
Fujita, Toshihito: *See*—
Nakazawa, Kogi; and Fujita, Toshihito, 4,840,755, Cl. 264-15.000.
Fujita, Yasuhiko: *See*—
Masuda, Eiji; Fujita, Yasuhiko; and Takasaki, Terufumi, 4,841,567, Cl. 379-355.000.
Fujitsu Limited: *See*—
Hosoyama, Osamu, 4,841,442, Cl. 364-405.000.
Kubota, Katuhisa, 4,841,168, Cl. 307-272.200.
Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, 4,841,524, Cl. 370-112.000.
Murakami, Joji; Sibazaki, Syogo; and Tempaku, Junya, 4,841,298, Cl. 341-51.000.
Nakano, Motoo, 4,841,349, Cl. 357-30.000.
Yasuda, Kazuhito; and Kishi, Yutaka, 4,840,916, Cl. 437-3.000.
Yoshida, Akira; and Sasaki, Yuuichi, 4,841,438, Cl. 364-200.000.
Yoshida, Masanobu, 4,841,233, Cl. 324-73.00R.
Fujitsu Microcomputer Systems Limited: *See*—
Murakami, Joji; Sibazaki, Syogo; and Tempaku, Junya, 4,841,298, Cl. 341-51.000.
Fujiwara, Hideo: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Fujiyama, Hirohisa: *See*—
Kimura, Akira; Kashiwabara, Hiroshi; and Fujiyama, Hirohisa, 4,841,116, Cl. 219-73.100.
Fujiyama, Masaaki: *See*—
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Suzuki, Masami; and Yamada, Yasuyuki, 4,840,842, Cl. 428-323.000.
Fukae, Kensuke; and Kaieda, Shozo, to Kentek Information Systems, Inc. Electrographic printer with small diameter drum and charged transfer belt. 4,841,334, Cl. 355-271.000.
Fukatsu, Takeo: *See*—
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Fukuhara, Satoru: *See*—
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.
Fukui, Mariko: *See*—
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.
Fukui, Norio: *See*—
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.
Fukui, Ryota: *See*—
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-111.810.
Fukui, Shosin; Shinjo, Masayoshi; and Aoyama, Hirokazu, to Daikin Kogyo Co., Ltd. Mold release composition. 4,840,675, Cl. 106-38.220.
Fukui, Yoshio: *See*—
Iwasaki, Tetsuji; and Fukui, Yoshio, 4,840,942, Cl. 514-120.000.
Fukumura, Yoshikazu: *See*—
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-32.70E.
Fukuouji, Kakujulo: *See*—
Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000.
Fukushima, Akio: *See*—
Suzuki, Motoyuki; Miura, Yoshio; and Fukushima, Akio, 4,841,511, Cl. 369-50.000.
Fukushima, Hiroshi: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Funabashi, Tadashi: *See*—
Kurihara, Toshihiko; and Funabashi, Tadashi, 4,841,517, Cl. 369-270.000.
Fung, Kwok K., to American Standard Inc. Island type refrigeration display cabinet. 4,840,040, Cl. 62-255.000.
Furihata, Makoto: *See*—
Watanabe, Kazuo; Furihata, Makoto; and Yamazaki, Kouichi, 4,841,484, Cl. 365-190.000.
Furrow, Robert E. Engine speed control circuit for drag racing. 4,840,157, Cl. 123-352.000.
Furukawa Aluminum Co., Ltd.: *See*—
Nabae, Motohiro, 4,840,685, Cl. 148-439.000.
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, to Sanyo Electric Co., Ltd. Secondary cell. 4,840,858, Cl. 429-197.000.
Furukawa, Takahiro: *See*—
Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, 4,841,524, Cl. 370-112.000.
Furusawa, Genichi: *See*—
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Furusawa, Masao: *See*—
Ototake, Satoshi; Matsunaga, Ryozo; and Furusawa, Masao, 4,841,034, Cl. 534-701.000.
Furuse, Masayasu: *See*—
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.
Furutachi, Nobuo: *See*—
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Furuyama, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor memory. 4,841,483, Cl. 365-189.070.
Fuse, Genzo: *See*—
Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.
Fushimi, Hiroyuki: *See*—
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.
Fushimi, Shigeo: *See*—
Watanabe, Takaya; and Fushimi, Shigeo, 4,841,265, Cl. 333-194.000.
Futaba Denshi Kogyo K.K.: *See*—
Kishino, Takao; and Mizohata, Tadashi, 4,841,194, Cl. 313-496.000.
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, to Hitachi, Ltd.; and Hitachi Maxell Ltd. Magnetic recording medium. 4,840,844, Cl. 428-336.000.
Futrell, James C., II, to United States of America, Interior. Fiber optic current meter with plastic bucket wheel. 4,840,062, Cl. 73-170.00A.
Fye, Donald M., to GTE Laboratories Incorporated. Methods of and apparatus for generation of radio frequency signals. 4,840,456, Cl. 350-162.170.
G & B Rubber Stamp Co., Inc.: *See*—
Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., 4,840,120, Cl. 101-228.000.
G. M. Pfaff, AG: *See*—
Dobner, Reinhold, 4,841,415, Cl. 362-90.000.
GA Technologies Inc.: *See*—
Bhadra, Dilip K.; Creedon, Richard L.; and Harder, C. Ross, 4,840,112, Cl. 91-459.000.
Gabriel, David; Audus, David; and Strange, Norman, to Lasercheck Limited. Laser position measurement and alignment. 4,840,490, Cl. 356-375.000.
Gafvelin, Guro; Carlquist, Mats; and Mutt, Viktor, to Kabigen AB. Mammal intestinal hormone precursor and its use. 4,840,785, Cl. 424-9.000.
Gaglani, Kamlesh; and Eilender, Albert, to Cosan Chemical Corporation. Bactericidal (3,5-substituted polyoxymethylene oxazolidines. 4,841,064, Cl. 548-215.000.
Galbreath, Donald E., to Galbreath Incorporated. Roll-off hoist for variable positioning of containers. 4,840,532, Cl. 414-479.000.
Galbreath Incorporated: *See*—
Galbreath, Donald E., 4,840,532, Cl. 414-479.000.
Gambini, Luciano: *See*—
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., to Bristol-Myers Company. Method for treatment of male impotence. 4,840,952, Cl. 514-253.000.
Gammerler, Gunter. Cutting knife for rotary cutting apparatus for paper. 4,840,098, Cl. 83-841.000.
Garbini, Joseph L.: *See*—
Chalupnik, James D.; Garbini, Joseph L.; and Jorgensen, Jens E., 4,841,224, Cl. 324-61.00P.
Gardiner, William, to Dow Corning, Ltd. Liquid organopolysiloxane compositions. 4,840,743, Cl. 252-49.600.
Gardner, Christopher H.: *See*—
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., to International Business Machines Corporation. Chromium-titanium alloy. 4,840,302, Cl. 228-123.000.
Garels, John: *See*—
Rooney, Craig E., 4,840,476, Cl. 351-63.000.
Garg, Rakesh K. Second method for using cannula including a valve structure and associated instrument elements. 4,840,184, Cl. 128-753.000.
Garland, Milton W., to Frick Company. Ice builder and control system therefor. 4,840,033, Cl. 62-59.000.

Garnjost, Kenneth D., to Moog Inc. Energy-conserving regenerative-flow valves for hydraulic servomotors. 4,840,111, Cl. 91-436.000.
Garret, Michael J., to Cardball International Limited. Poker and pool apparatus. 4,840,376, Cl. 273-14.000.
Garwood, Anthony J. M., to Garwood, Ltd. Improved thermoplastic skin packing means. 4,840,271, Cl. 206-213.100.
Garwood, Ltd.: *See*—
Garwood, Anthony J. M., 4,840,271, Cl. 206-213.100.
Gas Energy, Inc.: *See*—
Russo, Onofrio N., 4,840,049, Cl. 70-34.000.
Gas Research Institute: *See*—
Hemsath, Klaus H., 4,840,559, Cl. 432-3.000.
Gasser, George E. Quick release seat support. 4,840,343, Cl. 248-500.000.
Gastgeb, Raymond F., to Pennwalt Corporation. Piezoelectric phase locked loop circuit. 4,841,256, Cl. 331-25.000.
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, to Farmitalia Carlo Erba s.r.l. Pharmaceutical compositions containing anthracycline glycosides. 4,840,938, Cl. 514-34.000.
Gaughan, Roger G., to Phillips Petroleum Company. Catalytic preparation of poly(arylene sulfide) from halothiophenol. 4,841,018, Cl. 528-374.000.
Gausman, Theodore J.; and Scheffel, Gary W., to Nupro Company. Inflatable valve. 4,840,191, Cl. 137-15.000.
Gawol, Manfred; and Adrian, Gerhard, to Dr. Hans Heubach GmbH & Co. KG. Corrosion-inhibiting pigments, their production and use. 4,840,668, Cl. 106-14.210.
Gayer, Herbert; and Jelich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 2-cyano-2-oximino-acetamide derivatives. 4,841,086, Cl. 558-301.000.
Geberth, John D., Jr. Clutch apparatus for rapid power source conversion. 4,840,543, Cl. 417-223.000.
Gebruder Heller GmbH. Werkzeugfabrik: *See*—
Kleine, Werner, 4,840,519, Cl. 408-226.000.
Gelinas, Yvon. Ceiling rack. 4,840,278, Cl. 211-18.000.
General Atomics: *See*—
Burnett, Sibley C.; Purcell, John R.; Breneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.
Creedon, Richard L., 4,840,200, Cl. 138-172.000.
General Company Limited: *See*—
Ueyama, Seiji; and Onoe, Hiroyasu, 4,840,835, Cl. 428-212.000.
General DataComm, Inc.: *See*—
Hill, Gregory P., 4,841,561, Cl. 379-97.000.
General Dynamics Land Systems, Inc.: *See*—
Cory, Robert M., 4,840,438, Cl. 305-36.000.
General Electric Company: *See*—
Campbell, John R.; Williams, Robert E., Jr.; Brown, Sterling B.; Conroy, Paul M.; and Florence, Robert A., 4,840,982, Cl. 524-151.000.
Clark, Clarence O.; and Hong, Jauwhei, 4,840,850, Cl. 428-471.000.
Coffinberry, George A., 4,840,025, Cl. 60-217.000.
Crivello, James V.; and Lee, Julia L., 4,840,977, Cl. 522-25.000.
Edelstein, William A.; and Schenck, Frederick, 4,840,700, Cl. 156-634.000.
Fox, Daniel W.; Peters, Edward N.; and Sybert, Paul D., 4,841,015, Cl. 528-198.000.
Gross, David C.; Lewis, Larry N.; and Haig, Connie L., 4,840,974, Cl. 521-85.000.
Hawkins, Christopher M., 4,841,001, Cl. 525-468.000.
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., 4,841,467, Cl. 364-748.000.
Hsu, Sheng T., 4,841,347, Cl. 357-23.900.
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., 4,840,450, Cl. 350-96.200.
Raychaudhuri, Dipankar; and Joseph, Kuriacose, 4,841,527, Cl. 371-32.000.
Remer, James N., 4,840,457, Cl. 350-255.000.
Strong, Michael F., 4,840,459, Cl. 350-333.000.
Thomas, Sherman G., 4,840,586, Cl. 439-680.000.
General Instrument Corporation: *See*—
Wachob, David E., 4,841,569, Cl. 380-7.000.
General Mills, Inc.: *See*—
Greenberg, Norman A.; Chandan, Ramesh C.; Deeslie, William D.; and Conolly, Daniel D., 4,840,813, Cl. 426-565.000.
General Motors Corporation: *See*—
Hoying, John F.; and Lange, Bernard, 4,840,358, Cl. 267-140.100.
Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., 4,839,990, Cl. 49-352.000.
Maschino, Dale C., 4,841,130, Cl. 235-96.000.
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,839,958, Cl. 29-450.000.
Genetic Engineering, Inc.: *See*—
van Blerkom, Jonathan, 4,840,891, Cl. 435-2.000.
Genuit, Gerard: *See*—
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,840,221, Cl. 165-41.000.
George, Frederick A., to George & Thomas Cone Company. Cone package. 4,840,276, Cl. 206-499.000.
George, Michael; Pierson, Lyndon G.; and Wilkins, Mark E., to United States of America, Energy. Universal null DTE. 4,841,550, Cl. 375-118.000.
George & Thomas Cone Company: *See*—
George, Frederick A., 4,840,276, Cl. 206-499.000.
George Weston Limited: *See*—
Lawford, Hugh G., 4,840,902, Cl. 435-161.000.
Georges, Alain: *See*—
Boula, Gerard; and Georges, Alain, 4,839,951, Cl. 29-157.400.
Gerbaud, Claude: *See*—
Krasuski, Marek; Gregoire, Jean-Pierre; and Gerbaud, Claude, 4,840,696, Cl. 156-353.000.
Gerber Garment Technology, Inc.: *See*—
Osthus, Harold L.; de Raismes, John F.; Wolfson, Lawrence S.; and Vaida, Robert M., 4,840,123, Cl. 104-100.000.
Gerber Scientific Instrument Company, The: *See*—
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,841,316, Cl. 354-4.000.
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., to Motorola, Inc. Data card circuits. 4,841,133, Cl. 235-492.000.
Gergely, Vera: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.
Gerhard, Helmut, to Westerwaelder Eisenwerk Gerhard GmbH. Pressure-resistant tank. 4,840,282, Cl. 220-1.500.
Gesellschaft fur Automation u. Organization mbH: *See*—
Grottrup, Helmut; and Maurer, Thomas, 4,841,128, Cl. 235-491.000.
Getech A/S: *See*—
Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., 4,841,192, Cl. 310-337.000.
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, to Francotyp-Postalia GmbH. Cassette with a tape box for tape dispensers of mail processing machines. 4,840,367, Cl. 271-160.000.
GH Trading AB: *See*—
Gustafsson, Hans; and Hallberg, Thomas, 4,840,340, Cl. 248-240.400.
Ghandeharizadeh, Shahryar, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber splice organizer. 4,840,449, Cl. 350-96.200.
Ghemini Technologies: *See*—
Khattak, Chandra P.; White, Vernon E.; Schmid, Frederick; and Wohlgemuth, John H., 4,840,699, Cl. -//.000.
Gherardi, Gian L., to Sasib S.p.A. Method and device for controlling the vacuum in a succession of suction conveyors. 4,840,266, Cl. 198-471.100.
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, to Dompe' Farmaceutici S.p.A. Process for the preparation of pyridobenzodiazepinone. 4,841,046, Cl. 540-495.000.
Giebel, Wolfgang: *See*—
Oestreich, Ulrich; and Giebel, Wolfgang, 4,841,103, Cl. 174-70.00S.
Gilbert, David A. Electric trolling motor steering system. 4,841,203, Cl. 318-53.000.
Giles, George R.: *See*—
Ehrenhalt, Dan; and Giles, George R., 4,841,258, Cl. 332-9.00R.
Giles, Randy K.: *See*—
Lucas, Gordon H.; and Giles, Randy K., 4,840,003, Cl. 52-233.000.
Gillet, Guy: *See*—
Chappoux, Claude; Rouesnel, Bernard; and Gillet, Guy, 4,840,264, Cl. 194-212.000.
Gillies, David, to Deutsche ITT Industries GmbH. Data compander for digital video signals. 4,841,357, Cl. 358-17.000.
Ginter, Douglas R.: *See*—
Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., 4,840,747, Cl. 252-301.40R.
Gionet, Edmond R.: *See*—
Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., 4,839,990, Cl. 49-352.000.
Girmi S.P.A. Corso Matteoth: *See*—
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Giusti, Frank, Jr.: *See*—
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.
Givaudan Corporation: *See*—
Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, 4,841,063, Cl. 548-213.000.
Glamkowski, Edward J.; Chiang, Yulin; and Ehrgott, Frederick J., Jr., to Hoechst-Roussel Pharmaceuticals, Inc. Antiinflammatory and analgesic piperidin-4-yl-tetracyclic benzodiazepines and use thereas. 4,840,947, Cl. 514-219.000.
Glattstein, Baruch, to Erez Forensic Technology, Ltd. Process for drug detection. 4,840,912, Cl. 436-92.000.
Glen, Robert D., to E.P. Barrus Limited. Carburettor. 4,840,752, Cl. 261-72.100.
Glidden Company, The: *See*—
Pekarik, Alan J., 4,840,980, Cl. 523-456.000.
Glopak Inc.: *See*—
Jones, Elwyn D.; Lauzon, Robert; and Wetter, Bruno, 4,840,609, Cl. 493-28.000.
Gluckman, Jack L., to University of Cincinnati. Method of laser treatment of cancerization of the oral cavity. 4,840,174, Cl. 128-303.100.
Godtfredsen, Wagn O.; and von Daehne, Welf, to Leo Pharmaceutical Products Ltd. Antibacterial beta-lactams, pharmaceuticals thereof and methods of using them. 4,840,944, Cl. 514-195.000.
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, to BASF Aktiengesellschaft. Preparation of 3-methyl-1-vinylimidazolium chlorides. 4,841,066, Cl. 548-335.000.

Goetze, Werner; Mayr, Ernst; Oestreich, Ulrich; and Saller, Helmut, to Siemens Aktiengesellschaft. Filling compound for light waveguide leads and/or light waveguide cables. 4,839,970, Cl. 350-96.230.

Gogami, Masao: *See*—
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-488.000.

Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, to Laurel Bank Machines Co., Ltd. Dust-proof tube having a cylindrical portion that seals photosensor and integrally formed frustrum portion. 4,841,144, Cl. 250-239.000.

Goi, Masami: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.

Golander, Carl G.; Jonsson, Erik S.; and Vladkova, Todorka G., to Ytkemiska Institutet. Surface coated article, process and means for the preparation thereof and use thereof. 4,840,851, Cl. 428-523.000.

Gold, Elijah H.: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Goldberg, Edward M.: *See*—
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., 4,840,690, Cl. 156-242.000.

Goldman, Giora. Hydraulic-pneumatic actuator for impact cutter. 4,840,236, Cl. 173-134.000.

Goldman, Leman, Jr. Lid loosener and tightener. 4,840,093, Cl. 81-3.430.

Goldman, Michael C. Container for injection needles with safety apparatus. 4,840,272, Cl. 206-365.000.

Goller, Ernst; and Walker, Fritz, to H. Stoll GmbH & Co. Procedure and device for ensuring a precisely positioned introduction of a substitute yarn in a knitting machine. 4,840,046, Cl. 66-144.000.

Gombert, Guido: *See*—
Kallabis, Manfred; and Gombert, Guido, 4,840,633, Cl. 623-23.000.

Gonnet, Olivier; Ravet, Georges; and Rousset, Jacky, to Coatex, S. A. Grinding agent based and/or copolymers for aqueous suspension of coarse mineral materials for pigment applications. 4,840,985, Cl. 524-425.000.

Gonzalez, Carlos H.: *See*—
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.

Gooch, Timothy D.: *See*—
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-419.00R.

Goodfellow, Anthony G.; and Wright, Anthony R., to W&A Bates Limited. Apparatus for handling sheet material. 4,840,697, Cl. 156-405.100.

Goodman, Joseph R.; and Thrush, Roger L., to AMP Incorporated. Slide switch configured as an integrated circuit package. 4,841,105, Cl. 200-16.00D.

Goodwin, Ernest, to Hemlo Gold Mines Inc. Process for the removal of cyanide and other impurities from solution. 4,840,735, Cl. 210-721.000.

Goossens, John: *See*—
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.

Gornowicz, Gerald A.: *See*—
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., 4,840,796, Cl. 424-448.000.

Gossett, Wayne L.: *See*—
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.

Gotanda, Motohiro. Lock device with trigger bolt. 4,840,050, Cl. 70-107.000.

Goto, Chiaki; and Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Rotary light beam deflector with revolution surface mirror. 4,841,135, Cl. 350-6.800.

Goto, Kenichi: *See*—
Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, 4,840,152, Cl. 123-52.0MV.

Goto, Kiyoshi: *See*—
Kita, Noriyasu; and Goto, Kiyoshi, 4,840,869, Cl. 430-191.000.

Goto, Yoshihiko: *See*—
Muramatsu, Hidenori; Yamada, Kimichika; Nozawa, Katsuya; and Goto, Yoshihiko, 4,841,392, Cl. 360-85.000.

Gottneid, David J.: *See*—
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Gottsegen, Agnes: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Goud, Richard B.: *See*—
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Grady, Robert J.: *See*—
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., 4,841,343, Cl. 355-77.000.

Graeber, Richard N., to McWilliams Machinery Sales, Division of Bridgeport Machines Inc. Rotary table wire EDM machine. 4,841,126, Cl. 219-69.200.

Graham Engineering Corporation: *See*—
Johnston, Brian J.; and Klinedinst, Paul W., 4,840,366, Cl. 271-9.000.

Graham Fiber Glass Limited: *See*—
Perrella, Guido, 4,840,013, Cl. 53-429.000.

Graham, Louis A., to Burlington Industries, Inc. Fluid jet applicator apparatus. 4,841,307, Cl. 346-1.100.

Graham, Patricia K.; and Williams, Robert R., to International Business Machines Corporation. Method and apparatus for testing three state drivers. 4,841,232, Cl. 324-73.00R.

Graham, Samuel L.: *See*—
Shepard, Kenneth L.; and Graham, Samuel L., 4,840,963, Cl. 514-418.000.

Grantham, Debs E. Grafting apparatus. 4,839,986, Cl. 47-6.000.

Grass, Alfred, to Alfred Grass Ges.m.b.H. Metallwarenfabrik. Rapidcy mountable furniture hinge with snap closure. 4,839,940, Cl. 16-258.000.

Gratton, Enrico, to I.S.S. (U.S.A.) Inc. Frequency domain cross-correlation fluorometry with phase-locked loop frequency synthesizers. 4,840,485, Cl. 356-317.000.

Gray Electronics, Inc.: *See*—
Henry, Philip, 4,841,302, Cl. 342-20.000.

Grayline Housewares: *See*—
Cobb, Dean L.; and Bleser, Edward M., 4,840,279, Cl. 211-88.000.

Graziano, Anthony: *See*—
Chu, Mosi; Graziano, Anthony; and Kress, Kenneth, 4,840,504, Cl. 400-213.000.

Green, Edward A.; and Stambaugh, Clayton S., to Taylor-Winfield Corporation, The. Hot heading plastic rivets by resistance heating. 4,841,121, Cl. 249-243.000.

Greenberg, Norman A.; Chandan, Ramesh C.; Deeslie, William D.; and Conolly, Daniel D., to General Mills, Inc. Low and non-fat frozen dairy desserts and method of preparation. 4,840,813, Cl. 426-565.000.

Greene, Tweed & Co.: *See*—
Thoman, Richard A., Jr., 4,840,379, Cl. 277-222.000.

Greenleaf, Eugene F. Gravel shield for hitch travel trailer. 4,840,400, Cl. 280-770.000.

Greer, Dale R.: *See*—
Dewar, Robert; and Greer, Dale R., 4,841,460, Cl. 364-571.020.

Gregoire, Jean-Pierre: *See*—
Krasuski, Marek; Gregoire, Jean-Pierre; and Gerbaud, Claude, 4,840,696, Cl. 156-353.000.

Grey, Michael O., to NCR Corporation. Thermal transfer ribbon cassette. 4,840,502, Cl. 400-196.000.

Griffin, James D.: *See*—
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

Grines, Tyrone C. Modular salon station. 4,840,000, Cl. 52-36.000.

Groenenboom, Cornelis J.; and Wieringa, Peter A., to Akzo NV. Process for cracking hydrocarbon feeds. 4,840,724, Cl. 208-120.000.

Grogan, Larry N., to Velcro Industries B.V. Bistable panel attachment system. 4,840,339, Cl. 248-205.200.

Grogp, Ulrich: *See*—
Tacke, Peter; Grogp, Ulrich; and Idel, Karsten-Josef, 4,841,000, Cl. 525-437.000.

Groh, Allen R., to Lighting Technology, Inc. Heat-dissipating light fixture for use with tungsten-halogen lamps. 4,841,422, Cl. 362-294.000.

Grohe, Klaus: *See*—
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,841,059, Cl. 546-312.000.

Grollier, Jean F., to L'Oreal. Dentifrice containing a poly(hydroxypropyl ether) non-ionic surfactant and a specified cationic polymer. 4,840,787, Cl. 424-52.000.

Grollier, Jean-Francois; and Fourcadier, Chantal, to L'Oreal. Cosmetic composition for the treatment of the hair and scalp containing in combination a poly-beta-alanine and nicotinic acid or an ester thereof. 4,840,790, Cl. 424-70.000.

Grollimund, Everett C.: *See*—
Brookman, Donald L.; Merrill, David E.; and Grollimund, Everett C., 4,840,694, Cl. 156-344.000.

Groothoff, Hermann: *See*—
Lekholm, Anders; Fahlstroem, Ulf; and Groothoff, Hermann, 4,840,186, Cl. 128-784.000.

Gross, David C.; Lewis, Larry N.; and Haig, Connie L., to General Electric Company. Method for reducing silicone foam density and silicone foam compositions. 4,840,974, Cl. 521-85.000.

Grosskopf, Rudiger; and Kessler, Christoph, to Boehringer Mannheim GmbH. Restriction endonuclease Dra II. 4,840,901, Cl. 435-91.000.

Grottrup, Helmut; and Maurer, Thomas, to Gesellschaft fur Automation u. Organization mbH. Circuit unit. 4,841,128, Cl. 235-491.000.

Grumman Aerospace Corporation: *See*—
Avaneas, Napoleon G., 4,841,551, Cl. 375-118.000.
Hampton, Herbert R.; Fodale, Robert; and Conkling, Charles R., Jr., 4,840,069, Cl. 73-802.000.

Grunewald, Gerhard; and Kriebel, Manfred, to Metallgesellschaft Aktiengesellschaft; and Linde Aktiengesellschaft. Process for regenerating absorbents containing CO_2 and COS. 4,840,648, Cl. 55-44.000.

Gschwend, Hans; Hachtel, Hans; and Wanger, Werner, to Hilti Aktiengesellschaft. Expansion dowel assembly. 4,840,527, Cl. 411-344.000.

GTE Laboratories Incorporated: *See—*
Fye, Donald M., 4,840,456, Cl. 350-162.170.

GTE Products Corporation: *See—*
Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., 4,840,747, Cl. 252-301.40R.
Husted, Eric F.; and Ladd, Judith A., 4,840,775, Cl. 423-150.000.
Husted, Eric F., 4,840,776, Cl. 423-150.000.
Prager, Lee A.; and Carbone, Douglas C., 4,841,127, Cl. 219-225.000.
Waymouth, John F., 4,841,196, Cl. 315-65.000.

GTE Valenite Corporation: *See—*
Plutschuck, Lawrence; and Ochenski, James E., 4,840,518, Cl. 407-113.000.

Guegan, Remy: *See—*
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.

Guenot, Andre; and Cantou, Christian J. R., to U.S. Philips Corporation. Arrangement for receiving numerical data, comprising a circuit for recognizing the start of packets. 4,841,365, Cl. 358-147.000.

Guentert, Josef: *See—*
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.

Guentner, Andreas; Mayer, Udo; and Oberlinner, Andreas, to BASF Aktiengesellschaft. Carbazole containing benzopyrans. 4,841,050, Cl. 544-150.000.

Guerinot, William F.: *See—*
Rumbolt, Robin B.; Guerinot, William F.; and Dargis, Daniel J., 4,841,368, Cl. 358-194.100.

Guevel, Jean; Francois, Marc; and Bontemps, Guy, to Sa Schappe. Continuous multifilament sewing thread and process for making same. 4,840,021, Cl. 57-210.000.

Guichard, Jacques; and Cassimatis, Eric. Circuit for the fast calculation of the direct or inverse cosine transform of a discrete signal. 4,841,464, Cl. 364-725.000.

Guidat, Thierry: *See—*
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,839,978, Cl. 42-65.000.

Guistina, Robert A.: *See—*
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.

Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, to BASF Aktiengesellschaft. Aqueous binder dispersions for the preparation of paints & finishes. 4,840,990, Cl. 524-504.000.

Gundel, Wolf-Dieter: *See—*
Fingerle, Dieter; and Gundel, Wolf-Dieter, 4,840,154, Cl. 123-193.00H.

Gundlach, Robert W.; and Bergen, Richard F., to Xerox Corporation. Self-cleaning scorotron with focused ion beam. 4,841,146, Cl. 250-324.000.

Guslits, Vladimir S.; and Bailey, Steven P., to Eastman Kodak Company. Drive mechanism for a reproduction apparatus. 4,840,259, Cl. 192-48.200.

Gustafsson, Hans; and Hallberg, Thomas, to GH Trading AB. Telescopic brace assembly. 4,840,340, Cl. 248-240.400.

Gustafsson, Helmer, to Yhtyneet Paperitehtaat Oy Jylhavaara. Welded conical grinding cutter. 4,840,318, Cl. 241-294.000.

Guzy, D. James: *See—*
Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.

H. Stoll GmbH & Co.: *See—*
Goller, Ernst; and Walker, Fritz, 4,840,046, Cl. 66-144.000.

Habeger, Charles C., Jr.: *See—*
Baum, Gary A.; and Habeger, Charles C., Jr., 4,841,223, Cl. 324-58.50A.

Haberrecker, Klaus; and Roth, Rainer, to Siemens Aktiengesellschaft. X-radiator with circulating pump for heat dissipation. 4,841,557, Cl. 378-141.000.

Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Benzazolythio-carbapenem antibiotics. 4,840,946, Cl. 514-210.000.

Habich, Dieter; and Hartwig, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of carbapenem intermediates. 4,841,042, Cl. 540-200.000.

Hachtel, Hans: *See—*
Gschwend, Hans; Hachtel, Hans; and Wanger, Werner, 4,840,527, Cl. 411-344.000.

Hackett, Steven B. Scaffolding connector apparatus. 4,840,513, Cl. 403-49.000.

Haefele, Walter: *See—*
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.

Haertl, Christof: *See—*
Birkholz, Ulrich; Haertl, Christof; and Nassler, Peter, 4,840,249, Cl. 181-129.000.

Haffner, James L., to Cincinnati Milacron Inc. Alignment tool for laser beam delivery systems and method of alignment. 4,840,483, Cl. 356-153.000.

Hagan, Robert A.; and Reinwall, Ernest W., to Elco Industries, Inc. Device for dampening rotary motion. 4,840,083, Cl. 74-574.000.

Hagedorn, Myrna L.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.

Hagemann, Hermann; and Sasse, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 4-mercaptobenzonitriles, and 4-mercaptobenzonitriles. 4,841,089, Cl. 558-412.000.

Hagen, Susan E.: *See—*
Domagala, John M.; Hagen, Susan E.; Sanchez, Joseph P.; and Solomon, Marjorie S., 4,840,956, Cl. 514-312.000.

Hagino, Hideyuki; and Kusano, Takahiro, to Kabushiki Kaisha Toshiba. Phase equalizing active filter. 4,841,179, Cl. 307-520.000.

Hagiwara, Hiroshi: *See—*
Ishida, Takeo; Hagiwara, Hiroshi; and Kakumu, Ichizo, 4,839,992, Cl. 51-5.00D.

Hagiwara, Yoshiaki; Ishida, Hiromi; and Takahashi, Takeyoshi, to Bridgestone Corporation. Rubber kneading method. 4,840,491, Cl. 366-69.000.

Hahn, Granville J., to Permian Research Corporation. Drying method and apparatus. 4,839,969, Cl. 34-169.000.

Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, to Siemens Aktiengesellschaft. Gas laser discharge tube with ceramic wafers and cooling wafers in a stack. 4,841,539, Cl. 372-63.000.

Hahn, Herbert: *See—*
Zollner, Christine; and Hahn, Herbert, 4,840,718, Cl. 204-286.000.

Haider, Gottfried, to Voest-Alpine Aktiengesellschaft. Fuel injection nozzle. 4,840,310, Cl. 239-533.400.

Haig, Connie L.: *See—*
Gross, David C.; Lewis, Larry N.; and Haig, Connie L., 4,840,974, Cl. 521-85.000.

Hakala, Harri, to Kone Elevator GmbH. Method for controlling the semiconductor switches of a rectifier bridge connected to an a.c. mains supply, and a control unit designed for applying the method. 4,841,426, Cl. 363-37.000.

Hakim, Shafik J.; Locher, Mark R.; Nieng, Kenneth Y.; and Vagnozzi, Barbara A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for accessing data from data attribute tables. 4,841,433, Cl. 364-200.000.

Hakoyama, Akiyoshi: *See—*
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.

Hallberg, Thomas: *See—*
Gustafsson, Hans; and Hallberg, Thomas, 4,840,340, Cl. 248-240.400.

Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, to Honda Giken Kogyo Kabushiki Kaisha. Welding control apparatus and method. 4,841,113, Cl. 219-110.000.

Hamaekers, Arno; and Rudolph, Axel, to Carl Freudenberg, Firma. Encapsulated rubber cushion. 4,840,359, Cl. 267-140.100.

Hamamatsu Photonics Kabushiki Kaisha: *See—*
Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,841,234, Cl. 324-96.000.

Hamanishi, Yoshinari: *See—*
Hoshino, Kunihisa, deceased; Hamanishi, Yoshinari; and Utagawa, Ken, 4,841,325, Cl. 354-402.000.

Hamm, Sidney R., to Cooper Industries, Inc. Recloser plenum puffer interrupter. 4,841,108, Cl. 200-148.00A.

Hammelmann, Paul. High pressure plunger pump. 4,840,548, Cl. 417-469.000.

Hamori, Tamas: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Hampton, Herbert R.; Fodale, Robert; and Conkling, Charles R., Jr., to Grumman Aerospace Corporation. Electro-optic space positioner with background compensator. 4,840,069, Cl. 73-802.000.

Hanamura, Shoji: *See—*
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.

Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, to McGhan Medical Corporation. Self-sealing injection reservoir. 4,840,615, Cl. 604-93.000.

Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Toner control for a developer device. 4,841,332, Cl. 355-251.000.

Haneda, Satoshi: *See—*
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, 4,841,337, Cl. 355-157.000.

Hanna, Stephen D.: *See—*
Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., 4,841,453, Cl. 364-519.000.

Hansen, Albert F., to Hansen Development Limited. Water spray fitting. 4,840,313, Cl. 239-456.000.

Hansen, Charles: *See—*
Cooper, Roy; and Hansen, Charles, 4,841,189, Cl. 310-257.000.

Hansen, David E., to Eastman Kodak Company. Apparatus for loading a film cassette into a camera. 4,841,319, Cl. 354-275.000.

Hansen Development Limited: *See—*
Hansen, Albert F., 4,840,313, Cl. 239-456.000.

Hansen, James E.: *See*—
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.

Hansen, Ove, to Transpower A/S. Heat-distributing winding. 4,841,270, Cl. 336-61.000.

Hao, Chung-Hsing. Speed changing device for electric fans. 4,841,188, Cl. 310-200.000.

Hara, Yukihiko; and Suzuki, Tateo, to Mitsui Norin Co., Ltd. Method of treating hypertension. 4,840,966, Cl. 514-456.000.

Harada, Hidetoshi; Chihara, Satoshi; Suginaka, Yutaka; Suido, Shigeko; and Kobayashi, Toshitaka, to Meiji Milk Products Company Limited. Process for making a calcium enriched milk. 4,840,814, Cl. 426-580.000.

Harada, Naoki: *See*—
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,032, Cl. 534-642.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,033, Cl. 534-642.000.
Sawamoto, Hirokazu; Omura, Takashi; and Harada, Naoki, 4,841,048, Cl. 544-74.000.

Harada, Takashi: *See*—
Mizutani, Isao; Hijikata, Toshihiko; and Harada, Takashi, 4,840,827, Cl. 428-116.000.

Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, to Tosoh Corporation. Laminated article from molding compositions of a chlorosulfonated polyolefin and a fluorine-containing elastomer. 4,840,849, Cl. 428-419.000.

Haraguchi, Kazuo: *See*—
Sato, Yasuhiro; and Haraguchi, Kazuo, 4,840,265, Cl. 198-446.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corporation. Conversion of alkanes to alkylenes in an external catalyst cooler for the regenerator of a FCC unit. 4,840,928, Cl. 502-41.000.

Harber, James L.: *See*—
Harber, Sue E.; and Harber, James L., 4,840,497, Cl. 383-4.000.

Harber, Sue E.; and Harber, James L. Sunshades storage case. 4,840,497, Cl. 383-4.000.

Harder, C. Ross: *See*—
Bhadra, Dilip K.; Creedon, Richard L.; and Harder, C. Ross, 4,840,112, Cl. 91-459.000.

Hardy, Dwayne E., to Menlo Care, Inc. Kink resistant catheter. 4,840,622, Cl. 604-264.000.

Hardy, Frederick E.; and Walley, Darlene R., to Procter & Gamble Company, The. Stable biodegradable fabric softening compositions containing 2-hydroxypropyl monoester quaternized ammonium salts. 4,840,738, Cl. 252-8.600.

Hargrave, Maxine: *See*—
Mai, M. Jane; and Hargrave, Maxine, 4,839,929, Cl. 4-254.000.

Harigaya, Makoto: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.

Harnden, James A., to Siliconix Incorporated. Limiting shoot-through current in a power MOSFET half-bridge during intrinsic diode recovery. 4,841,166, Cl. 307-246.000.

Harnisch, Horst; and Raue, Roderich, to Bayer Aktiengesellschaft. Naphthalic acid imides electrophotographic toners. 4,841,052, Cl. 544-361.000.

Harris Corp.: *See*—
Chan, Aaron; Pierce, Ben; and Shafto, Leslie, 4,841,560, Cl. 379-29.000.
Crabill, Carl A., 4,841,253, Cl. 330-277.000.

Harris, John C. Novelty golf club with programmed sound playing device. 4,840,371, Cl. 272-8.00N.

Harris, Robert L. Soybean fiber in insect rearing media. 4,840,800, Cl. 426-2.000.

Harrison, Anthony W., to Lucas Industries public limited company. Brake adjusters. 4,840,257, Cl. 188-196.00D.

Harrow Products, Inc.: *See*—
Sowersby, Alan C., 4,840,411, Cl. 292-251.500.

Harth, Ralf: *See*—
Schonlau, Juergen; Birkenbach, Alfred; and Harth, Ralf, 4,840,433, Cl. 303-9.680.

Hartley, James F. M., to Foseco International Limited. Rotary pouring nozzle for a vessel for holding molten metal. 4,840,295, Cl. 222-598.000.

Hartman, Janet A. Postbox signal. 4,840,307, Cl. 232-35.000.

Hartmann, Gunter; Swoboda, Ralf; and Lang, Robert, to Siemens Aktiengesellschaft. Manipulation device for hose mounting. 4,839,954, Cl. 29-235.000.

Hartmann, Uwe; and Ohnemus, Fritz, to Deutsche Thomson-Brandt GmbH. Method of generating a voltage with a triangular shape from a sawtooth waveform. 4,841,251, Cl. 328-36.000.

Hartmann, Wilbert J. A. M., to U.S. Philips Corporation. Method of driving a ferroelectric liquid crystal display device and associated display device to achieve gray scale. 4,840,462, Cl. 350-350.00S.

Hartwig, Wolfgang: *See*—
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Habich, Dieter; and Hartwig, Wolfgang, 4,841,042, Cl. 540-200.000.

Harvey, Robert D. Method and apparatus for dispensing oil well proppant additive. 4,840,292, Cl. 222-1.000.

Harvey, Robert J., to Scientific Design Company, Inc. Preparation of alkylene carbonates. 4,841,072, Cl. 549-230.000.

Hasegawa, Gary K. Clip and holder. 4,840,341, Cl. 248-316.500.

Hasegawa, Masakasu: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.

Haselton, E. Fletcher: *See*—
Mann, James A., Jr.; and Haselton, E. Fletcher, 4,840,570, Cl. 439-74.000.

Hasenrath, Peter: *See*—
Senft, Helmut; and Hasenrath, Peter, 4,840,385, Cl. 277-53.000.

Haseoka, Masahide: *See*—
Yamada, Jiro; Haseoka, Masahide; and Obata, Isao, 4,841,503, Cl. 369-14.000.

Hashiguchi, Makoto: *See*—
Yamato, Akihiro; and Hashiguchi, Makoto, 4,840,156, Cl. 123-339.000.

Hashimoto, Fumiharu: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,841,461, Cl. 364-572.000.

Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., to Bayer Aktiengesellschaft. Radical anion salts of derivatives of 1,4,5,8-naphthalenetetracarboxylic acid and their use. 4,841,073, Cl. 549-232.000.

Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., to Eaton Corporation. MRS current sensor. 4,841,235, Cl. 324-117.00R.

Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, to Mitsubishi Chemical Industries Limited. Polyethylene terephthalate resin composition. 4,840,981, Cl. 524-114.000.

Hata, Hitoshi: *See*—
Tsubouchi, Toshiyuki; Abe, Kazuaki; and Hata, Hitoshi, 4,840,745, Cl. 252-73.000.

Hatakeyama, Seiji: *See*—
Usami, Toshimasa; Hatakeyama, Seiji; and Shimomura, Akihiro, 4,840,933, Cl. 503-213.000.

Hatta, Koichi: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.

Hatta, Toyoji: *See*—
Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, 4,841,008, Cl. 528-45.000.

Hattori, Noboru: *See*—
Oshidari, Toshikazu; Hattori, Noboru; and Kato, Yoshiaki, 4,840,261, Cl. 192-106.00F.

Hattori, Tadashi: *See*—
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Hauer, Jean-Claude: *See*—
Defrance, Andre; and Hauer, Jean-Claude, 4,840,514, Cl. 404-25.000.

Hauke, Dieter; and Zelle, Edgar, to Licentia Patent-Verwaltungs-GmbH. Electric motor with attached tachogenerator. 4,841,187, Cl. 310-171.000.

Hauser, Josef: *See*—
Bibracher, Wilhelm; and Hauser, Josef, 4,840,595, Cl. 445-28.000.

Hautemont, Jean-Claude, to Societe a Responsabilite Limitee. Installation for the simultaneous thermoforming of at least one row of containers in thermoplastic material, each container being provided with a decorative banderole. 4,840,555, Cl. 425-500.000.

Hawkins, Christopher M., to General Electric Company. Functionalized thermoplastic polymer having dicyclopentadienyl groups in polymer chain. 4,841,001, Cl. 525-468.000.

Hawkins, Gilbert: *See*—
Sheu, Yea-Dean; and Hawkins, Gilbert, 4,840,918, Cl. 437-53.000.

Hawkins, Ross H.; Laing, David; and Bedington, Bryan C., to Bryna Pty. Ltd. Photographic apparatus for making simultaneous exposures. 4,841,359, Cl. 358-76.000.

Hay, Leon, to L'air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for treating a gaseous mixture by adsorption. 4,840,647, Cl. 55-26.000.

Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Semiconductor laser device having a graded index waveguide. 4,841,533, Cl. 372-45.000.

Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, to Toyota Jidosha Kabushiki Kaisha. System for controlling idling speed in internal combustion engine for vehicle with automatic transmission. 4,841,447, Cl. 364-431.070.

Hayashi, Motohiko: *See*—
Kotani, Matahira; Hayashi, Motohiko; and Yamanoue, Masafumi, 4,841,374, Cl. 358-280.000.

Hayashi, Nobuyasu: *See*—
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.

Hayes Microcomputer Products, Inc.: *See*—
Heberling, James R.; Hicks, Mark; and Watts, Nancy, 4,840,286, Cl. 220-306.000.

Haynie, Robert L.: *See*—
Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.

Hazato, Atsuo: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,841,091, Cl. 558-441.000.

Hearthstone Builders, Inc.: *See*—
Lucas, Gordon H.; and Giles, Randy K., 4,840,003, Cl. 52-233.000.
Heberling, James R.; Hicks, Mark; and Watts, Nancy, to Hayes Microcomputer Products, Inc. Equipment enclosure with internal fasteners. 4,840,286, Cl. 220-306.000.
Hedges, Allan R.: *See*—
Ammeraal, Robert N.; Hedges, Allan R.; and Gottneid, David J., 4,840,679, Cl. 127-40.000.
Heesemann, Juergen, to Karl Heesemann Maschinenfabrik GmbH & Co. KG. Belt grinding machine. 4,839,994, Cl. 51-165.720.
Heft, Dallas E.; and Carignan, Donald A. Furnace viewing system. 4,840,474, Cl. 350-572.000.
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, to Richards Metal Company. Magnet for installation in the middle ear. 4,840,178, Cl. 128-419.00R.
Heidenfelder, Herbert J. Desensitizing condom. 4,840,188, Cl. 128-844.000.
Heidinger, George H.: *See*—
Evans, Vernon C.; and Heidinger, George H., 4,841,159, Cl. 307-38.000.
Heilman, Raymond D.: *See*—
Dohogne, L. Ranney; and Heilman, Raymond D., 4,841,183, Cl. 310-90.000.
Heilmann, Steven M.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.
Heilweil, Emanuel: *See*—
Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, 4,841,063, Cl. 548-213.000.
Heimann GmbH: *See*—
Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, 4,841,554, Cl. 378-57.000.
Heinen, Jochen, to Siemens Atiengesellschaft. Light-emitting-diode (LED) with spherical lens. 4,841,344, Cl. 357-17.000.
Heinmiller, Wesley H.: *See*—
Bowles, Gary L., 4,841,165, Cl. 307-132.00R.
Heja, Gergely: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.
Heleen, Harold E.; and Heleen, Lucille M. Bag tie dispenser. 4,840,319, Cl. 242-55.530.
Heleen, Lucille M.: *See*—
Heleen, Harold E.; and Heleen, Lucille M., 4,840,319, Cl. 242-55.530.
Helft, Ross G.: *See*—
Adams, George W.; Smock, Steven W.; and Helft, Ross G., 4,841,496, Cl. 368-107.000.
Hellige GmbH: *See*—
Ullrich, Georg J., 4,840,179, Cl. 128-633.000.
Helling, Gunter: *See*—
Peters, Manfred; Helling, Gunter; and Reiff, Helmut, 4,840,885, Cl. 430-559.000.
Heltai, Krisztina: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Hemlo Gold Mines Inc.: *See*—
Goodwin, Ernest, 4,840,735, Cl. 210-721.000.
Hemsath, Klaus H., to Gas Research Institute. Seal arrangement for high temperature furnace applications. 4,840,559, Cl. 432-3.000.
Heng, Jean-Paul; Ruiz, Ariel; and Boissonnet, Alain, to CGEE Althom. Slotted connection arrangement for an electric wire, and a corresponding connection tool. 4,840,579, Cl. 439-395.000.
Henke, Ulrich: *See*—
Baumgartner, Hans; Brandstadter, Manfred; and Henke, Ulrich, 4,840,550, Cl. 418-150.000.
Hennessy, Robert E., to Cars & Concepts, Inc. Vehicle convertible top frame side rail linkage assembly. 4,840,421, Cl. 296-122.000.
Henny Penny Corporation: *See*—
Brewer, Edward L.; and Clark, John M., 4,840,287, Cl. 220-316.000.
Henrich, Hans-Otto, to J. M. Voith GmbH. Wood pulp grinder. 4,840,317, Cl. 241-282.000.
Henriquez, Percy C., to Douwe Egberts Koninklijke Tabaks-fabriek-Koffiebranderijen-Theehandel N.V. Process for separating solid particles and/or liquid from a suspension and wash column. 4,840,737, Cl. 210-772.000.
Henrot, Denis: *See*—
Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, 4,841,455, Cl. 364-525.000.
Henry, Philip, to Gray Electronics, Inc. Transmitter detector for use in a moving vehicle. 4,841,302, Cl. 342-20.000.
Henry, Samuel B.; and Kuhns, James J., to Cadillac Gage Textron Inc. Dynamic track tensioning system for tracked vehicles. 4,840,437, Cl. 305-10.000.
Henson, Thomas L.: *See*—
Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., 4,840,747, Cl. 252-301.40R.
Herion-Werke KG: *See*—
Ott, Helmut, 4,840,198, Cl. 137-625.640.
Hermam, Jan S.: *See*—
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, to August Sauter GmbH. Visual display apparatus for information items. 4,841,280, Cl. 340-706.000.
Hernandez, Manuel. Blood sampling device with shield. 4,840,185, Cl. 128-763.000.
Herrmann, Gert, to Uni-Cardan AG. Clutch plate. 4,840,262, Cl. 192-106.200.
Hersom, Dana A. Electric fish landing net. 4,839,980, Cl. 43-11.000.
Herzog, Siegfried; Eckert, Dieter; and Bausch, Max, to Daimler-Benz Aktiengesellschaft. External mirror for vehicles. 4,840,475, Cl. 350-604.000.
Hewitt, Brian. Composite holographic elements. 4,840,444, Cl. 350-3.850.
Hewlett-Packard Company: *See*—
Charbonnier, Francis M.; Rockwell, Martin G.; and Benvegar, Carl E., 4,840,177, Cl. 128-419.00D.
Noguchi, Hitoshi; and Wakamatsu, Hideki, 4,841,228, Cl. 324-62.000.
Heyler, Charles J., III: *See*—
Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,840,615, Cl. 604-93.000.
Heys, George, Jr.; Yandora, Andrew E.; and McDowell, Philip D., to NCR Corporation. Electronic apparatus assembly. 4,841,412, Cl. 361-393.000.
Heywang, Gerhard: *See*—
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, to Murata Manufacturing Co., Ltd. High frequency apparatus chassis and circuit board construction. 4,841,414, Cl. 361-424.000.
Hicks, Mark: *See*—
Heberling, James R.; Hicks, Mark; and Watts, Nancy, 4,840,286, Cl. 220-306.000.
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, to Dai Nippon Insatsu Kabushika Kaisha. IC card. 4,841,134, Cl. 235-488.000.
Hider, Robert C.; Kontoghiorghes, George; and Silver, Jack, to National Research Development Corporation. Novel 3-hydroxypyrid-2-ones and 3-hydroxyprid-4-ones useful in treating patients having a toxic concentration of iron. 4,840,958, Cl. 514-348.000.
Higashionji, Masaru: *See*—
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.
Higbee, Wallace C.; and Bauer, Barney J., to TRW Vehicle Safety Systems Inc. Seat belt retractor having a comfort mechanism with full memory and slack set. 4,840,324, Cl. 242-107.600.
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, to Honda Giken Kogyo Kabushiki Kaisha. Seat belt tightening device. 4,840,325, Cl. 242-107.200.
Hihara, Toshio: *See*—
Kato, Yoshiaki; and Hihara, Toshio, 4,841,029, Cl. 534-634.000.
Hijack Light, Inc., The: *See*—
Wilson, John A., 4,841,277, Cl. 340-426.000.
Hijikata, Toshihiko: *See*—
Mizutani, Isao; Hijikata, Toshihiko; and Harada, Takashi, 4,840,827, Cl. 428-116.000.
Hilfman, Lee: *See*—
Johnson, Russell W.; and Hilfman, Lee, 4,840,722, Cl. 208-95.000.
Hill, Adrian C.; and Jepson, Derek, to Rolls-Royce Motors Limited; and Castrol Limited. Hydraulic fluid containers and reservoirs. 4,840,206, Cl. 141-349.000.
Hill, Gregory P., to General DataComm, Inc. Operating default group selectable data communication equipment. 4,841,561, Cl. 379-97.000.
Hill, Hugh A. O.; and Libor, Susan I., to Medisense, Inc. Electrochemical assay for nucleic acids and nucleic acid probes. 4,840,893, Cl. 435-6.000.
Hillwell Manufacturing Inc.: *See*—
Merlin, Dennis, 4,840,291, Cl. 221-59.000.
Hilti Aktiengesellschaft: *See*—
Bisping, Heinz; Leibhard, Erich; and Mauthe, Peter, 4,840,524, Cl. 411-82.000.
Gschwend, Hans; Hachtel, Hans; and Wanger, Werner, 4,840,527, Cl. 411-344.000.
Hilton, Robert R.: *See*—
Coggin, J. Thayer; and Hilton, Robert R., 4,839,938, Cl. 16-45.000.
Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, to Siemens Aktiengesellschaft. Testing device for both-sided contacting of component-equipped printed circuit boards. 4,841,241, Cl. 324-158.00F.
Himeno, Kiyoshi: *See*—
Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, 4,841,036, Cl. 534-761.000.
Hinds, William S.: *See*—
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., 4,841,115, Cl. 219-60.00A.
Hino, Youichi; Shimasaki, Yuuji; and Ueshima, Michio, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Vapor-phase intramolecular dehydration reaction of alkanolamines. 4,841,060, Cl. 546-184.000.

Hioki, Takanori: *See—*
Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, 4,840,862, Cl. 430-75.000.
Hirabayashi, Shigefumi; and Nakajima, Toshio, to Mazda Motor Corporation. Four-wheel steering vehicle. 4,840,243, Cl. 180-140.000.
Hirai, Shoichi: *See—*
Kobayashi, Tetuo; and Hirai, Shoichi, 4,840,080, Cl. 74-501.50R.
Hirano, Masachika: *See—*
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,971, Cl. 514-721.000.
Hirano, Shunji: *See—*
Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, 4,841,370, Cl. 358-227.000.
Hirao, Motohisa: *See—*
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.
Hirata, Yasuyuki: *See—*
Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, 4,840,715, Cl. 204-181.100.
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, to Konica Corporation. Image forming apparatus. 4,841,337, Cl. 355-157.000.
Hiratsuka, Seiichiro; and Matsunawa, Masahiko, to Konishiroku Photo Industry Co., Ltd. Continuous image estimation method. 4,841,377, Cl. 358-283.000.
Hiratsuka, Seiichiro: *See—*
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,841,332, Cl. 355-251.000.
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, to Hirayama, Chuichi; Motozato, Yoshiaki; Ihara, Hirotaka; Juridical Foundation The Chemo-Sero-Therapeutic Research Institute; and Mitsui Toatus Chemical, Inc. Spherical grains of polyamino acid and production method thereof. 4,840,975, Cl. 521-183.000.
Hirobe, Kazushi: *See—*
Somemiya, Akiyoshi; and Hirobe, Kazushi, 4,840,984, Cl. 524-394.000.
Hirosawa, Kazutoyo: *See—*
Kubota, Shinji; Hirosawa, Kazutoyo; and Yoshida, Tomio, 4,841,512, Cl. 369-54.000.
Hirose Electric Co., Ltd.: *See—*
Sato, Kensaku, 4,840,578, Cl. 439-395.000.
Hirose, Masumi: *See—*
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, to Fuji Photo Film Co., Ltd. Method of color image formation using a high chloride emulsion and a developer free of benzyl alcohol. 4,840,878, Cl. 430-380.000.
Hirschberg, Jakub: *See—*
Saell, Goesta; and Hirschberg, Jakub, 4,840,580, Cl. 439-431.000.
Hirschkorn, Ingo, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Extrusion head equipped with a clamping device for the tool components. 4,840,554, Cl. 425-190.000.
Hitachi Cable, Ltd.: *See—*
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.
Hitachi Device Engineering Co., Ltd.: *See—*
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.
Hitachi Koki Company, Limited: *See—*
Mochizuki, Takeshi; Arimoto, Akira; and Saito, Susumu, 4,841,137, Cl. 250-236.000.
Hitachi, Ltd.: *See—*
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Inaba, Tohru, 4,841,354, Cl. 357-71.000.
Ishizuka, Takuo, 4,841,475, Cl. 364-900.000.
Kakumoto, Shigeru; Sumi, Tatsuo; and Kurisu, Tetsuo, 4,841,443, Cl. 364-413.010.
Kamisada, Toshimasa; and Saito, Akira, 4,841,509, Cl. 369-46.000.
Kataoka, Keiji, 4,840,447, Cl. 350-96.140.
Kato, Yasuo; Ochiai, Isao; Watanabe, Yoshio; and Murayama, Seiichi, 4,841,556, Cl. 378-119.000.
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.
Miyazaki, Hideki; Onda, Kenichi; and Matsuda, Yasuo, 4,841,427, Cl. 363-62.000.
Mochizuki, Takeshi; Arimoto, Akira; and Saito, Susumu, 4,841,137, Cl. 250-236.000.
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.
Nakamura, Shozo; Mathusima, Tokunori; and Tsuji, Kunio, 4,840,766, Cl. 376-378.000.
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, 4,841,439, Cl. 364-200.000.
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, 4,840,487, Cl. 356-355.000.
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.
Suzuki, Motoyuki; Miura, Yoshio; and Fukushima, Akio, 4,841,511, Cl. 369-50.000.
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.
Takizawa, Kazuyoshi; and Watanuki, Kiyoshi, 4,841,201, Cl. 315-411.000.
Tamura, Hifumi; Shichi, Hiroyasu; and Umemura, Kaoru, 4,841,143, Cl. 250-288.000.
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, 4,841,514, Cl. 369-100.000.
Tsuji, Michiru; Konno, Chisato; and Saji, Miyuki, 4,841,479, Cl. 364-900.000.
Watanabe, Kazuo; Furihata, Makoto; and Yamazaki, Kouichi, 4,841,484, Cl. 365-190.000.
Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizawa, Isamu, 4,840,146, Cl. 123-52.0MB.
Hitachi Maxell Ltd.: *See—*
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Hitachi Medical Corp.: *See—*
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, 4,840,180, Cl. 128-661.080.
Kondo, Shinichi; Katakura. Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.
Hitachi Software Engineering Co., Ltd.: *See—*
Kakumoto, Shigeru; Sumi, Tatsuo; and Kurisu, Tetsuo, 4,841,443, Cl. 364-413.010.
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., to Dyneer Corporation. Pulley for poly-v belt. 4,840,607, Cl. 474-167.000.
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., to General Electric Company. Architecture to implement floating point multiply/accumulate operations. 4,841,467, Cl. 364-748.000.
Hoaki, Hiroshi: *See—*
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.
Hocker, Jurgen: *See—*
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.
Hodge, Bobby L.: *See—*
White, Craig E.; and Hodge, Bobby L., 4,840,600, Cl. 464-111.000.
Hodjat, Yahya: *See—*
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., 4,840,607, Cl. 474-167.000.
Hoechst Aktiengesellschaft: *See—*
Elsaesser, Andreas; and Rode, Klaus, 4,840,867, Cl. 430-156.000.
Kaminsky, Walter; and Buschermohle, Maria, 4,841,004, Cl. 526-160.000.
Kuehnert, Hans-Guenter E., 4,840,698, Cl. 156-485.000.
Pawlowski, Georg; Hultsch, Guenter; and Mack, Gerhard, 4,840,868, Cl. 430-155.000.
Pliefke, Engelbert, 4,840,709, Cl. 204-2.000.
Pliefke, Engelbert, 4,840,713, Cl. 204-129.750.
Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Effland, Richard C.; and Effland, Joseph T., 4,840,972, Cl. 514-313.000.
Glamkowski, Edward J.; Chiang, Yulin; and Ehrgott, Frederick J., Jr., 4,840,947, Cl. 514-219.000.
Hoekstra, George: *See—*
Kreifels, Jerry A.; and Hoekstra, George, 4,841,482, Cl. 365-185.000.

Hoffman, Arthur R., to International Business Machines Corporation. High performance ink jet print head for use in a high speed printer. 4,841,310, Cl. 346-75.000.
Hoffman, Charles R.: *See—*
Bukowski, Eugene R.; and Hoffman, Charles R., 4,841,254, Cl. 330-253.000.
Hoffman, Michael J., to Wacker Silicones Corporation. Silicone containing emulsions as bladder lubricants. 4,840,742, Cl. 252-49.500.
Hoffman, Wilfried: *See—*
Dahrendorf, Klaus-Dieter; Huennebeck, Volker; and Hoffman, Wilfried, 4,840,170, Cl. 128-202.260.
Hoffman, William F.: *See—*
Lee, Ta J.; and Hoffman, William F., 4,841,074, Cl. 549-292.000.
Hoffmann-La Roche Inc.: *See—*
Pauling, Horst; and Wehrli, Christof, 4,841,070, Cl. 549-34.000.
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kerah, Douglas W., to Boeing Company, The. Test system and method using artificial intelligence control. 4,841,456, Cl. 364-550.000.
Hogshead, Howard P.: *See—*
Bremer, Ross L.; and Hogshead, Howard P., 4,840,362, Cl. 269-328.000.
Holland Equipment Limited: *See—*
Mayer, Matthew E., 4,840,232, Cl. 172-21.000.
Hollenstein, Helmut: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,840,512, Cl. 403-22.000.
Hollingsworth, John D.; and Rookstool, Gary H., to John D. Hollingsworth On Wheels, Inc., a part interest. Feed roll sensor for a textile carding machine. 4,839,944, Cl. 19-105.000.
Holmwood, Graham; Weissmuller, Joachim; Brandes, Wilhelm; and Reinecke, Paul, to Bayer Aktiengesellschaft. Heterocyclic amide derivatives. 4,840,961, Cl. 514-399.000.
Home Fashions, Inc.: *See—*
John, Julius F., 4,840,216, Cl. 160-178.100.
Homeyer, Bernhard: *See—*
Tarnow, Horst; and Homeyer, Bernhard, 4,840,969, Cl. 514-617.000.
Honda Giken Gokyo Kabushiki Kaisha: *See—*
Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, 4,840,152, Cl. 123-52.0MV.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, 4,840,608, Cl. 474-205.000.
Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.
Kubo, Kanji, 4,840,396, Cl. 280-690.000.
Sakata, Masayasu, 4,840,151, Cl. 123-90.430.
Shitanoki, Kazuaki, 4,840,078, Cl. 74-484.00R.
Yamato, Akihiro; and Hashiguchi, Makoto, 4,840,156, Cl. 123-339.000.
Honda, Yukio: *See—*
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Honeywell Inc.: *See—*
Bernot, Anthony J.; and Johnson, Michael J., 4,840,460, Cl. 350-333.000.
Kummer, Karl T., 4,841,286, Cl. 340-653.000.
Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, 4,841,458, Cl. 364-557.000.
Nerheim, Eldon, 4,840,122, Cl. 102-202.500.
Sullivan, Charles T.; and Zook, J. David, 4,841,140, Cl. 250-226.000.
Westell, William E., 4,841,317, Cl. 354-65.000.
Hong, Bahk, to Kia Motors Corporation. Seat for an automobile. 4,840,427, Cl. 297-346.000.
Hong, Jauwhei: *See—*
Clark, Clarence O.; and Hong, Jauwhei, 4,840,850, Cl. 428-471.000.
Honjyo, Shigeru: *See—*
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.
Honjyoh, Akira: *See—*
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.
Honma, Takeo: *See—*
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., to Enterprises International, Inc. Roll wrapping head transfer and placement apparatus. 4,840,008, Cl. 53-137.000.
Hoover Group, Inc.: *See—*
Snyder, Andrew W., 4,840,284, Cl. 220-5.00A.
Hori, Taizou, to Canon Kabushiki Kaisha. Recording apparatus for rerecording by repositioning recording medium. 4,841,388, Cl. 360-721.000.
Horie, Kiyoshi: *See—*
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Horie, Seiji: *See—*
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Horikawa, Kazuo: *See—*
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Horikosi, Katsumi: *See—*
Iwasaki, Takao; and Horikosi, Katsumi, 4,841,019, Cl. 528-388.000.
Horino, Koichi: *See—*
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.
Horn, Michael J.: *See—*
Lillywhite, M. James; and Horn, Michael J., 4,840,283, Cl. 220-5.00A.
Horn, Petr, to Albert Koch. Calibrated temperature sensor and method of calibrating same. 4,840,494, Cl. 374-1.000.
Horn, Thomas A.: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.
Horner, Terry A. Motionless mixers and baffles. 4,840,493, Cl. 366-339.000.
Horowitz, Bernard, to New York Blood Center, Inc. Inactivation of viruses in labile protein-containing compositions using fatty acids. 4,841,023, Cl. 530-351.000.
Horton, Paul J., to Therm-O-Disc, Incorporated. High temperature sensing apparatus. 4,841,273, Cl. 338-28.000.
Horvath, Gabor: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.
Hosaka, Sumio: *See—*
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Hoshi, Mitsunori: *See—*
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Hoshino, Chie, legal representative: *See—*
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Hoshino, Kimie: *See—*
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.
Hoshino, Kunihisa, deceased (by Hoshino, Chie, legal representative); Hamanishi, Yoshinari; and Utagawa, Ken, to Nikon Corporation. Automatic focusing device for camera. 4,841,325, Cl. 354-402.000.
Hoshino, Seiichi: *See—*
Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, 4,840,308, Cl. 236-13.000.
Hoshino, Yasushi: *See—*
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.
Hosokawa, Kazutaka: *See—*
Shimizu, Tetsuo; and Hosokawa, Kazutaka, 4,840,998, Cl. 525-276.000.
Hosoki, Shigeyuki: *See—*
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.
Hosoya, Masachi: *See—*
Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, 4,841,408, Cl. 361-220.000.
Hosoyama, Osamu, to Fujitsu Limited. POS system for updating look-up table. 4,841,442, Cl. 364-405.000.
Hotta, Yuji: *See—*
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
House Food Industrial Co., Ltd.: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,840,805, Cl. 426-129.000.
Household Manufacturing, Inc.: *See—*
Spraker, Wilbur A., Jr., 4,840,036, Cl. 62-172.000.
Howerton, Robert D.: *See—*
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.
Howton, Kenneth D.; Stewart, Robert G.; and Zeitler, Herman R., to Brush Fuses, Inc. Fuses and their manufacture. 4,841,356, Cl. 337-248.000.
Hoying, John F.; and Lange, Bernard, to General Motors Corporation. Hydraulic engine mount with air bladder tuning. 4,840,358, Cl. 267-140.100.
Hoyt, David D. Golf ball holder. 4,840,332, Cl. 224-274.000.
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., to International Business Machines Corporation. Magnetic transducer crash anticipation and response method and apparatus. 4,841,389, Cl. 360-75.000.
Hribar, Frank, to Fluid Regulators Corp. Control system for fluid pressure operated actuator. 4,840,031, Cl. 60-338.000.

Hsiung, Nancy: *See*—
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.
Hsu, Sheng H., to Nestec S.A. Agglomeration process. 4,840,809, Cl. 426-285.000.
Hsu, Sheng T., to General Electric Company. MOS VLSI device having shallow junctions and method of making same. 4,841,347, Cl. 357-23.900.
Hsue, Ching-Wen; and Lee, Wha-Joon, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for verifying the continuity between a circuit board and a test fixture. 4,841,240, Cl. 324-158.00P.
Hua, Wang, to Chengdu Aircraft Corporation. Continuous spark electronic igniter. 4,840,165, Cl. 123-606.000.
Hubele, Adolf: *See*—
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Hubner, Dirk: *See*—
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.
Hucks, Lacy K., Jr. Deer stand. 4,840,252, Cl. 182-187.000.
Hudson, Peter D.: *See*—
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., 4,841,133, Cl. 235-492.000.
Huei-Chin, Chen. Surveying method allowing greater freedom in positioning the surveying instruments. 4,839,967, Cl. 33-228.000.
Huels Aktiengesellschaft: *See*—
Bartz, Wilfried, 4,840,993, Cl. 525-66.000.
Huennebeck, Volker: *See*—
Dahrendorf, Klaus-Dieter; Huennebeck, Volker; and Hoffman, Wilfried, 4,840,170, Cl. 128-202.260.
Huff, Darrel: *See*—
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Hughes Aircraft Company: *See*—
Klayman, Arnold I., 4,841,572, Cl. 381-17.000.
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.
Washburn, Robert D.; and McClanahan, Robert F., 4,841,428, Cl. 363-75.000.
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., to Color Quest Inc. Water soluble coloring compositions containing sparkle components. 4,840,669, Cl. 106-19.000.
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., to Color Quest Inc. Water soluble coloring compositions containing sparkle components. 4,840,670, Cl. 106-19.000.
Hughes, Elaine L. Syringe. 4,840,619, Cl. 604-187.000.
Hultsch, Guenter: *See*—
Pawlowski, Georg; Hultsch, Guenter; and Mack, Gerhard, 4,840,868, Cl. 430-155.000.
Humphrey, Cecil T. Double bank grain cleaner and aspirator therefor. 4,840,727, Cl. 209-32.000.
Humphrey, John R., to International Packaging Machines, Inc. Stretch wrapping machine. 4,840,006, Cl. 53-64.000.
Hundeby, David R.: *See*—
Friggstad, Terrance; and Hundeby, David R., 4,840,233, Cl. 172-311.000.
Hunt, Warren H., Jr.: *See*—
Hyland, M. Elise; and Hunt, Warren H., Jr., 4,840,852, Cl. 428-654.000.
Hunter Automated Machinery Corporation: *See*—
Hunter, William A., 4,840,218, Cl. 164-169.000.
Hunter, Clifford P., to Shell Oil Company. Plant generation method. 4,840,906, Cl. 435-240.490.
Hunter, Harry L.: *See*—
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., 4,840,952, Cl. 514-253.000.
Hunter, James O.: *See*—
Austin, Frederick D.; Barclay, John L.; and Hunter, James O., 4,840,723, Cl. 208-106.000.
Hunter, William A., to Hunter Automated Machinery Corporation. Automatic matchplate molding system. 4,840,218, Cl. 164-169.000.
Hunter, William H., to Lilly Industries Limited. Substituted hexahydro-4H-indolo[6,5,4-cd]indoles. 4,841,056, Cl. 546-68.000.
Hurlemann, Ernst; Muller, Kurt; and Ruppen, Bruno, to Werkzeugmaschinenfabrick Oerlikon-Buhrle AG. Apparatus for the infeed of ammunition from an ammunition container to an automatic firing weapon. 4,840,108, Cl. 89-33.140.
Husemeyer, Hans; Mager, Herbert; and Konrad, Eugen, to Wella Aktiengesellschaft. Agent for dyeing hair. 4,840,639, Cl. 8-410.000.
Husted, Eric F.; and Ladd, Judith A., to GTE Products Corporation. Method for removing sodium and chloride from cobaltic hydroxide. 4,840,775, Cl. 423-150.000.
Husted, Eric F., to GTE Products Corporation. Method for removing sodium and ammonia from cobalt. 4,840,776, Cl. 423-150.000.
Hutchins, Alma A., to Hutchins Manufacturing Company. Abrading tool. 4,839,995, Cl. 51-170.0MT.
Hutchins Manufacturing Company: *See*—
Hutchins, Alma A., 4,839,995, Cl. 51-170.0MT.
Hutchinson: *See*—
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Huzino, Seizi: *See*—
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Hwang, Chi Y.: *See*—
Chih, Liu P.; and Hwang, Chi Y., 4,840,242, Cl. 180-8.100.
Hyland, M. Elise; and Hunt, Warren H., Jr., to Aluminum Company of America. Aluminum alloy vehicular member. 4,840,852, Cl. 428-654.000.
Hyldon, Roy; and Bhatia, Usha, to Pillsbury Company, The. Storage stable tomato - based sauce. 4,840,806, Cl. 426-270.000.
I.S.S. (U.S.A.) Inc.: *See*—
Gratton, Enrico, 4,840,485, Cl. 356-317.000.
Ichihara, Masaki, to NEC Corporation. Device operable like an automatic level control circuit for decoding a multivalued signal. 4,841,301, Cl. 341-126.000.
Ichikawa, Norihito; Someya, Ikeo; Oda, Osamu; and Amano, Toshio, to Sony Corporation. Video source selecting system. 4,841,367, Cl. 358-181.000.
Ichikawa, Yuh-Ichiro: *See*—
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, 4,841,051, Cl. 544-287.000.
Ichinose, Makoto: *See*—
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ICI Americas Inc.: *See*—
Beachell, Vicki T., 4,840,788, Cl. 424-59.000.
Ida, Katsumi: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.
Ide, Yasushi: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.
Idebro, Mats G.: *See*—
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.
Idel, Karsten-Josef: *See*—
Tacke, Peter; Grogp, Ulrich; and Idel, Karsten-Josef, 4,841,000, Cl. 525-437.000.
Idemitsu Kosan Company Limited: *See*—
Tsubouchi, Toshiyuki; Abe, Kazuaki; and Hata, Hitoshi, 4,840,745, Cl. 252-73.000.
Igashira, Kiyoteru: *See*—
Maeba, Yukio; and Igashira, Kiyoteru, 4,841,425, Cl. 363-21.000.
Ignasiak, Martin C., to Minnesota Mining and Manufacturing Company. Expanding surface mount compatible retainer post. 4,841,100, Cl. 174-138.00G.
Ihara, Hirotaka: *See*—
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.
Ihara, Keisuke; Alaki, Yasuhide; and Nomura, Jun, to Bridgestone Corporation. Golf ball. 4,840,381, Cl. 273-232.000.
Iida, Kazuyoshi: *See*—
Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, 4,840,251, Cl. 181-206.000.
Iijima, Kazumi: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material containing a 1h-pyrazole (3,2-C)-s-triazole derived magenta coupler. 4,840,886, Cl. 430-558.000.
Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Portable electronic device with means for checking data validity during read-out. 4,841,131, Cl. 235-380.000.
Iijima, Zenshiro, to Adger Kogyo Co., Ltd. Ink composition and a pressure sensitive reproducing. 4,840,833, Cl. 428-207.000.
Iimura, Kouichi: *See*—
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.
Iio, Satoshi; and Okuno, Akiyasu, to NGK Spark Plug Co., Ltd. Surface structure of AlN substrate and a process for producing the same. 4,840,853, Cl. 428-698.000.
Iizuka, Hiroyuki: *See*—
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, 4,840,883, Cl. 430-553.000.
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Novel amino acid derivatives. 4,841,067, Cl. 548-344.000.
Ikawa, Syouji: *See*—
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, to Toshiba Kikai Kabushiki Kaisha. Temperature indicating control apparatus having data storing function. 4,841,459, Cl. 364-557.000.
Ikeda, Hiroshi: *See*—
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, to Nissan Chemical Industries Ltd. Papermaking method. 4,840,705, Cl. 162-175.000.

Ikeda, Kenji: *See*—
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, 4,841,535, Cl. 372-46.000.
Ikeda, Masamichi: *See*—
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Ikeda, Minoru: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for production of 1-aminoanthraquinone. 4,840,749, Cl. 260-378.000.
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, to Hitachi, Ltd. Semiconductor memory device. 4,841,481, Cl. 365-154.000.
Ikeda, Toshihiro: *See*—
Aida, Akira; and Ikeda, Toshihiro, 4,840,153, Cl. 123-90.550.
Ikeda, Tsunemi; and Ota, Motoki, to Calsonic Corporation. Tail pipe structure of control type muffler. 4,840,030, Cl. 60-324.000.
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, to Ikegami, Fumio; and Mitsubishi Denki Kabushiki Kaisha. Digital communication system. 4,841,547, Cl. 375-53.000.
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, to Matsushita Electric Industrial Co., Ltd. Heat pump system. 4,840,042, Cl. 62-324.100.
Ikuhara, Isao: *See*—
Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, 4,840,981, Cl. 524-114.000.
Ikuta, Shinji: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.
Illinois Tool Works Inc.: *See*—
Ernst, Richard J., 4,840,294, Cl. 222-287.000.
Imagawa, Kazushige: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, to Mitsubishi Chemical Industries, Limited. Phenyl acothienylthiazoaniline dis-azo dye for polyester fibers. 4,841,036, Cl. 534-761.000.
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Optical head for an optical recording and reproducing apparatus. 4,841,507, Cl. 369-44.000.
Imai, Jun: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Imai, Shigeo: *See*—
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.
Imai, Yoshihiko: *See*—
Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, 4,841,498, Cl. 369-32.000.
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, to Hitachi, Ltd. Thin film magnetic head and method of manufacture. 4,841,402, Cl. 360-126.000.
Imokawa, Naoki: *See*—
Baba, Hisatoshi; Imokawa, Naoki; and Shiho, Makoto, 4,841,407, Cl. 361-146.000.
Imperial Chemical Industries PLC: *See*—
Cartwright, David, 4,840,664, Cl. 71-94.000.
INA Bearing Company, Inc.: *See*—
White, Craig E.; and Hodge, Bobby L., 4,840,600, Cl. 464-111.000.
INA Walzlager Schaeffler KG: *See*—
Zipprath, Michael; and Schmidt, Dieter, 4,840,160, Cl. 123-467.000.
Inaba, Tohru, to Hitachi, Ltd. Electronic device with peripheral protective electrode. 4,841,354, Cl. 357-71.000.
Inaba, Tsutomu: *See*—
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.
Inagaki, Yoshio: *See*—
Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, 4,840,862, Cl. 430-75.000.
Ing. Gunter Klemm Spezialunternehmen fur Bohrtechnik: *See*—
Klemm, Gunter, 4,840,238, Cl. 175-92.000.
Ingwersen, Hartwig: *See*—
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000.
Innofinance Altalanos Innovacios Penzintezet: *See*—
Kenyeres, Istvan; and Koch, Lehel, 4,840,751, Cl. 261-36.100.
Inoue, Akira: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.
Inoue, Hiroaki: *See*—
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.
Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, to Tosoh Corporation and Toso Susteel Co., Ltd. Process for producing a polyarylene sulfide. 4,840,986, Cl. 524-436.000.
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, to Fuji Xerox Co., Ltd. Thermal-electrostatic ink jet recording apparatus. 4,841,312, Cl. 346-160.00R.
Inoue, Tohru: *See*—
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.
Institut Francais du Petrole: *See*—
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, 4,840,783, Cl. 423-648.100.
Institut National de la Sante et de la Recherche Medicale: *See*—
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.
Institute of Paper Chemistry, The: *See*—
Baum, Gary A.; and Habeger, Charles C., Jr., 4,841,223, Cl. 324-58.50A.
Insulator Seal, Inc.: *See*—
Dunton, Arthur R., 4,841,098, Cl. 174-15.300.
Integrated Genetics, Inc.: *See*—
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.
Intel Corporation: *See*—
Kreifels, Jerry A.; and Hoekstra, George, 4,841,482, Cl. 365-185.000.
International Business Machine Corporation: *See*—
Flagello, Donis G.; Wilczynski, Janusz S.; and Witman, David F., 4,840,923, Cl. 437-189.000.
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., 4,840,503, Cl. 400-208.000.
International Business Machines Corp.: *See*—
Bukowski, Eugene R.; and Hoffman, Charles R., 4,841,254, Cl. 330-253.000.
Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., 4,841,453, Cl. 364-519.000.
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.
Graham, Patricia K.; and Williams, Robert R., 4,841,232, Cl. 324-73.00R.
Hoffman, Arthur R., 4,841,310, Cl. 346-75.000.
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., 4,841,389, Cl. 360-75.000.
Mitchell, James A.; and Bechdel, John F., 4,841,476, Cl. 364-900.000.
Pham, Xuan N.; and Wilson, John H., 4,841,574, Cl. 381-31.000.
Prilik, Ronald J.; and Varner, James R., 4,841,485, Cl. 365-201.000.
Swix, Scott R.; and Krueger, Leroy A., 4,841,291, Cl. 340-725.000.
International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.
International Packaging Machines, Inc.: *See*—
Humphrey, John R., 4,840,006, Cl. 53-64.000.
Intersonics Incorporated: *See*—
Danley, Thomas J.; and Rey, Charles A., 4,841,495, Cl. 367-191.000.
Inuzuka, Kenichi: *See*—
Shirasaki, Yoshikazu; and Inuzuka, Kenichi, 4,840,826, Cl. 428-36.910.
Invacare Corporation: *See*—
Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, 4,840,390, Cl. 280-250.100.
Ioka, Hideyuki: *See*—
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, 4,841,182, Cl. 310-68.00D.
Ipsco Inc.: *See*—
Boratto, Francisco; Yue, Stephen; and Jonas, John J., 4,840,051, Cl. 72-11.000.
Irie, Tsutomu, to See-Me Lights Corp. Electrical system for vehicle daytime running lights. 4,841,199, Cl. 315-83.000.
Ishibashi, Hiroshi: *See*—
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Ishibashi, Kazuhisa: *See*—
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.
Ishibashi, Koichiro: *See*—
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.
Ishida, Hiromi: *See*—
Hagiwara, Yoshiaki; Ishida, Hiromi; and Takahashi, Takeyoshi, 4,840,491, Cl. 366-69.000.
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, to Kawai Musical Instrument Manufacturing Co., Ltd. Keyboard. 4,840,104, Cl. 84-437.000.
Ishida, Takeo; Hagiwara, Hiroshi; and Kakumu, Ichizo, to Sintobrator, Ltd. Polishing device. 4,839,992, Cl. 51-5.00D.
Ishigami, Makoto: *See*—
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.

Ishige, Yoshio: *See*—
Yoshida, Tsukasa; Ishige, Yoshio; Matsudaira, Masaki; and Takahashi, Tadashi, 4,840,807, Cl. 426-48.000.
Ishiguro, Kazuyoshi: *See*—
Yamashita, Tatsuo; and Ishiguro, Kazuyoshi, 4,840,401, Cl. 280-804.000.
Ishihara, Ken: *See*—
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, 4,841,341, Cl. 355-43.000.
Ishihara, Satoshi: *See*—
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-488.000.
Ishihara, Yasunobu: *See*—
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, 4,840,953, Cl. 514-258.000.
Ishii, Fumio: *See*—
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.
Ishii, Kazuo: *See*—
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Ishikawa, Takeshi. Letter scale with coin counter-balance. 4,840,241, Cl. 177-172.000.
Ishikawa, Tetsushi; Okabe, Masato; and Kato, Hiroyasu, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo; and Kabushiki Kaisha Itoki. Apparatus for raising small animals. 4,840,142, Cl. 119-17.000.
Ishikawa, Wataru: *See*—
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Ishikawa, Yuichi: *See*—
Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, 4,841,408, Cl. 361-220.000.
Ishimoto, Kenji; and Kawabata, Kouji, to UBE Industries, Ltd. Vertical injection apparatus. 4,840,557, Cl. 425-555.000.
Ishinaga, Hideki: *See*—
Mitani, Katsuaki; and Ishinaga, Hideki, 4,840,471, Cl. 350-438.000.
Ishizawa, Isamu: *See*—
Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizawa, Isamu, 4,840,146, Cl. 123-52.0MB.
Ishizuka, Takuo, to Hitachi, Ltd. Data transfer system and method for channels with serial transfer line. 4,841,475, Cl. 364-900.000.
Isobe, Toshimi: *See*—
Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, 4,840,308, Cl. 236-13.000.
Isoda, Takeshi: *See*—
Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, 4,840,778, Cl. 423-324.000.
Isono, Koji: *See*—
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Israel Aircraft Industries Ltd.: *See*—
Ladan, Uri; Karton, Boaz; and Klipper, Aron, 4,840,105, Cl. 89-1.130.
Itagaki, Hidenobu, to Mitsubishi Denki Kabushiki Kaisha. Method for interpolative extension of nuclear magnetic resonance image. 4,841,247, Cl. 324-309.000.
Italtel Societa Italiana Telecomunicazioni s.p.a: *See*—
Lentini, Salvatore; and Patti, Giuseppe, 4,841,161, Cl. 307-85.000.
Ito, Akio; and Kato, Hiroshi, to Pilot Ink Co., Ltd. Synthetic resin pen unit. 4,840,509, Cl. 401-198.000.
Ito, Eiji: *See*—
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.
Ito, Hiroshi: *See*—
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Ito, Kazuhiro: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Ito, Ken: *See*—
Kawabe, Taketoshi; and Ito, Ken, 4,840,389, Cl. 280-91.000.
Ito, Mikio: *See*—
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, to Yamanouchi Pharmaceutical Co., Ltd. Isoflavone derivatives, and salts thereof, and cancerocidal and immunosuppressive agents containing the same. 4,841,077, Cl. 549-402.000.
Ito, Toshio: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Ito, Yasunobu: *See*—
Yamamoto, Masanari; Ito, Yasunobu; and Yokoyama, Shouji, 4,841,445, Cl. 364-424.100.
Ito, Yoshitomo: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, to Hitachi Medical Corp. Ultrasonic diagnosis apparatus for measurement of speed of moving medium in a living body. 4,840,180, Cl. 128-661.080.
Itoh, Hiroshi, to Toshiba Kikai Kabushi Kaisha. Position control system including a quick response control. 4,841,208, Cl. 318-561.000.
Itoh, Hiroshi: *See*—
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,840,263, Cl. 192-109.00F.
Itoh, Takuji: *See*—
Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, 4,840,778, Cl. 423-324.000.
ITT Corporation: *See*—
Cabourne, Michael K., 4,840,569, Cl. 439-65.000.
Muzslay, Steven Z., 4,840,585, Cl. 439-556.000.
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, to Konishiroku Photo Industry Co., Ltd. Heat-transfer image-receiving element. 4,840,870, Cl. 430-201.000.
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, to Konishiroku Photo Industry Co., Ltd. Heat developable color light-sensitive material. 4,840,882, Cl. 430-505.000.
Iwama, Satoshi: *See*—
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, 4,840,988, Cl. 524-476.000.
Iwamoto, Masayuki: *See*—
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Iwamoto, Yasuaki: *See*—
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.
Iwasaki, Akio; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Rotary head type recording and/or reproducing apparatus having mode selecting mechanism. 4,841,391, Cl. 360-85.000.
Iwasaki, Hiroyuki: *See*—
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.
Iwasaki, Takao; and Horikosi, Katsumi, to Kureha Kogyo Kabushiki Kaisha. Apparatus for producing polyarylenesulfides. 4,841,019, Cl. 528-388.000.
Iwasaki, Tameo; and Takashima, Kohki, to Tanabe Seiyaku Co., Ltd. Novel naphthalene derivative. 4,840,951, Cl. 514-239.500.
Iwasaki, Tetsuji; and Fukui, Yoshio, to Kao Corporation. Emulsifying dispersant and biocidal composition containing same. 4,840,942, Cl. 514-120.000.
Iwashita, Yoshiyuki: *See*—
Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, 4,841,129, Cl. 235-472.000.
Iwata, Hitoshi: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Iwata, Masanari, to Mitsubishi Denki Kabushiki Kaisha. Harmonic speed changer. 4,840,090, Cl. 74-804.000.
Iwata, Michihiro: *See*—
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Iwata, Syuji: *See*—
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.
Iwatsuki, Kunihiro: *See*—
Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, 4,841,447, Cl. 364-431.070.
Izawa, Koji: *See*—
Nakajima, Shunichi; and Izawa, Koji, 4,841,375, Cl. 353-280.000.
Izawa, Tetsurou: *See*—
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou, 4,841,369, Cl. 358-213.260.
Izuhara, Koichi; Caruso, Jeffrey L.; and Johnson, Theodore C., to Minolta Camera Kabushiki Kaisha. Word processor capable of automatic tilting of documents. 4,841,472, Cl. 364-900.000.
Izuka, Akihiro; Onizawa, Yoshio; and Yamashita, Mitsuru, to Daicel Chemical Industries, Ltd. Plastic substrate for optical disk and process for producing the same. 4,841,501, Cl. 369-13.000.
Izumi, Akira; Kishi, Tomomi; and Niwa, Hideo, to Toyota Jidosha Kabushiki Kaisha; and Sanmei Denki Kabushiki Kaisha. Movable yoke-type lifting magnet device. 4,840,417, Cl. 294-65.500.
Izumi Seimitsu Kogyo Kabushiki Kaisha: *See*—
Uchiyama, Hiromi; and Nakano, Tsuyoshi, 4,839,964, Cl. 30-43.600.
J. M. Voith GmbH: *See*—
Henrich, Hans-Otto, 4,840,317, Cl. 241-282.000.
Jablonski, Charles E.: *See*—
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., 4,840,671, Cl. 106-85.000.

Jabry, El Hadj: *See*—
Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, 4,840,925, Cl. 501-1.000.
Jackson, Garrett O.: *See*—
Youd, T. Leslie; and Jackson, Garrett O., 4,840,230, Cl. 166-382.000.
Jackson, J. R.: *See*—
Jackson, John R., 4,841,250, Cl. 324-349.000.
Jackson, John R., to Jackson, J. R.; and Arismendi, A. M. (Andy), Jr. Passive geophysical survey apparatus based upon the detection of the DC component of the vertical electrical potential of natural earth currents. 4,841,250, Cl. 324-349.000.
Jacobs, Charles P.: *See*—
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.
Jacobs, Jan A. M. H.: *See*—
Schraven, Petrus E. G.; and Jacobs, Jan A. M. H., 4,840,831, Cl. 428-152.000.
Jacobs Manufacturing Company, The: *See*—
McCarthy, Donald J., 4,840,387, Cl. 279-1.00K.
Jacobsen, Ole A., to Dansk Industri Syndikat A/S. System comprising a power-actuated gripper and a number of gripping objects, especially for use in an automated foundry plant, with fluid communication between said gripper and a gripping object being gripped by it. 4,840,416, Cl. 294-2.000.
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, to La Telemecanique Electrique. Symmetric percussion switching device using a head point over-run device. 4,841,106, Cl. 200-462.000.
Jager, Horst, to Bayer Aktiengesellschaft. Azo reactive dyestuffs. 4,841,030, Cl. 534-638.000.
Jaguar Cars Limited: *See*—
Parsons, Bryan N. V., 4,840,164, Cl. 123-559.100.
Jahanmir, Said: *See*—
Beltzer, Morton; and Jahanmir, Said, 4,840,741, Cl. 252-47.000.
James, Robert B., Jr.: *See*—
Kalnes, Tom N.; and James, Robert B., Jr., 4,840,721, Cl. 208-57.000.
James, Wesley, to Micronic Interface Technologies. Read-write optical disk. 4,841,515, Cl. 369-100.000.
Jangaard, Erling S., to Ruvo Automation Corporation. Method of applying a door hinge. 4,839,957, Cl. 29-434.000.
Janome Sewing Machine Co., Ltd.: *See*—
Orii, Akira; and Kongo, Takeshi, 4,841,206, Cl. 388-828.000.
Japan Styrene Paper Corporation: *See*—
Kuwabara, Hideki; and Yoshimura, Shohei, 4,840,973, Cl. 521-58.000.
Japan Tobacco Inc.: *See*—
Matsumoto, Takashi; Okada, Takashi; and Mizusaki, Sigenobu, 4,841,055, Cl. 546-261.000.
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.
Jasinski, Raymond J., to Cities Service Oil and Gas Corporation. Corrosion probe and method for measuring corrosion rates. 4,840,719, Cl. 204-404.000.
Jasper, Louis J., Jr., to United States of America, Army. Electromagnetic injector/railgun. 4,840,106, Cl. 89-8.000.
Javan, Ali, to Laser Science, Inc. System for generating a stable optical frequency. 4,841,529, Cl. 372-32.000.
Jeanes, Thomas O.: *See*—
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-16.000.
Jedick, Andrew L., to Diamond Products, Inc. Portable rotary power saw. 4,840,431, Cl. 299-39.000.
Jefferson, Carl M.: *See*—
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., 4,841,389, Cl. 360-75.000.
Jelich, Klaus: *See*—
Gayer, Herbert; and Jelich, Klaus, 4,841,086, Cl. 558-301.000.
Jelinek, Horst, to Siemens Aktiengesellschaft. Pyrolysis system. 4,840,129, Cl. 110-229.000.
Jenkins, Vaughn J.: *See*—
Morrison, Larry R.; and Jenkins, Vaughn J., 4,841,257, Cl. 331-26.000.
Jepson, Derek: *See*—
Hill, Adrian C.; and Jepson, Derek, 4,840,206, Cl. 141-349.000.
Jesmar S.A.: *See*—
Perez, Jose L. J., 4,840,597, Cl. 446-16.000.
Jessop, Paul A., to VG Instruments Group Limited. Multi-stream fluid sampling valve. 4,840,074, Cl. 73-864.810.
John D. Hollingsworth On Wheels, Inc.: *See*—
Hollingsworth, John D.; and Rookstool, Gary H., 4,839,944, Cl. 19-105.000.
John Fluke Mfg. Co., Inc.: *See*—
Eccleston, Larry E., 4,841,170, Cl. 307-310.000.
Eccleston, Larry E., 4,841,229, Cl. 324-63.000.
John, Julius F., to Home Fashions, Inc. Valance bracket for a vertical blind. 4,840,216, Cl. 160-178.100.
Johnson, Edward R. Process for absorbing liquid leaks and spills. 4,840,734, Cl. 210-660.000.
Johnson & Johnson Patient Care, Inc.: *See*—
Linsky, Gary; Cunningham, Timothy; and Pines, Eli, 4,840,626, Cl. 604-364.000.
Johnson, Michael J.: *See*—
Bernot, Anthony J.; and Johnson, Michael J., 4,840,460, Cl. 350-333.000.
Johnson, Michael R.: *See*—
Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, 4,841,078, Cl. 549-402.000.
Johnson, Paul; and Karnebogen, Karl W., to Bayerische Motoren Werke Aktiengesellschaft. Air outlet arrangement of a heating and/or air-conditioning installation, especially for the rear space of a passenger motor vehicle. 4,840,115, Cl. 98-2.030.
Johnson, Philip S.; and Bakken, Theresa A., to Procter & Gamble Company, The. Aerosol antiperspirant compositions. 4,840,786, Cl. 424-43.000.
Johnson, Robert E.: *See*—
Chen, Hsiang M.; Eusepi, Martin W.; and Johnson, Robert E., 4,841,184, Cl. 310-90.500.
Johnson, Russell W.; and Hilfman, Lee, to UOP. Non-catalytic process for the conversion of a hydrocarbonaceous stream containing halogenated organic compounds. 4,840,722, Cl. 208-95.000.
Johnson, Stephen C.: *See*—
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.
Johnson, Theodore C.: *See*—
Izuhara, Koichi; Caruso, Jeffrey L.; and Johnson, Theodore C., 4,841,472, Cl. 364-900.000.
Johnston, Brian J.; and Klinedinst, Paul W., to Graham Engineering Corporation. In-mold labeling apparatus and method. 4,840,366, Cl. 271-9.000.
Jolson, Joseph D.: *See*—
Williams, Mark T.; Winchester, Clinton S.; and Jolson, Joseph D., 4,840,859, Cl. 429-212.000.
Jonas, John J.: *See*—
Boratto, Francisco; Yue, Stephen; and Jonas, John J., 4,840,051, Cl. 72-11.000.
Jonelis, John A.; and Bata, John I., to Midwest Power Corporation. Adjustable buttress for use in an electrostatic precipitator. 4,840,649, Cl. 55-140.000.
Jones, Elwyn D.; Lauzon, Robert; and Wetter, Bruno, to Glopak Inc. Bag folding machine. 4,840,609, Cl. 493-28.000.
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., to Syntex (U.S.A.) Inc. Naphthalene anti-psoriatic agents. 4,840,965, Cl. 514-450.000.
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., to General Electric Company. Apparatus and method for optical fiber end positioning for laser injection. 4,840,450, Cl. 350-96.200.
Jones, Michael R.: *See*—
Cleary, Edward J., Jr.; Coleman, Mike R.; and Jones, Michael R., 4,841,200, Cl. 315-363.000.
Jones, Robert L.: *See*—
Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., 4,840,066, Cl. 73-597.000.
Jonson, Bjorn: *See*—
Olsson, Sven G.; and Jonson, Bjorn, 4,840,167, Cl. 128-28.000.
Jonsson, Erik S.: *See*—
Golander, Carl G.; Jonsson, Erik S.; and Vladkova, Todorka G., 4,840,851, Cl. 428-523.000.
Jorgensen, Jens E.: *See*—
Chalupnik, James D.; Garbini, Joseph L.; and Jorgensen, Jens E., 4,841,224, Cl. 324-61.00P.
Jose, Vince A., to Westinghouse Electric Corp. Rotary combustor. 4,840,132, Cl. 110-246.000.
Joseph, Ady, to Metafuse Limited. Process for the fusion of one element into a second element. 4,840,711, Cl. 204-15.000.
Joseph, Kuriacose: *See*—
Raychaudhuri, Dipankar; and Joseph, Kuriacose, 4,841,527, Cl. 371-32.000.
Josereau, Bernard, to Etablissements Maurice Maillard. Bicycle free-wheel starwheel and free wheel provided with such a starwheel. 4,840,260, Cl. 192-64.000.
Jou, Shoei-Sheng: *See*—
Lay, Bor-Cherng; and Jou, Shoei-Sheng, 4,841,162, Cl. 307-112.000.
Jouade, Pierre, to Hutchinson. Hydraulic antivibratory support sleeves. 4,840,357, Cl. 267-140.100.
Joulain, Daniel; Racine, Philippe; and Maire, Francoise, to Robertet S.A. Agent neutralizing bad smells from excretions and excrements of animals. 4,840,792, Cl. 424-76.100.
Juds, Mark A.; and Beihoff, Bruce C., to Eaton Corporation. Multiturn shaft position sensor having magnet movable with nonrotating linear moving nut. 4,841,246, Cl. 324-208.000.
Juds, Mark A.: *See*—
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.
Jujo Paper Co., Ltd.: *See*—
Muramatsu, Mitsuru; and Tominaga, Ryuichiro, 4,840,011, Cl. 53-381.00R.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Hollenstein, Helmut, 4,840,512, Cl. 403-22.000.
Jungmann, Andreas; and Reilard, Ulrich, to Allmineral Aufbereitungstechnik GmbH & Co. KG. Device for aerating fluids, in particular during flotation. 4,840,753, Cl. 261-76.000.

Juridical Foundation The Chemo-Sero-Therapeutic Research Institute: *See*—
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.

Jusionis, Vytautas J.: *See*—
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., 4,841,115, Cl. 219-60.00A.

Just, Ernst K.; and Nickol, Robert G., to Aqualon Company. Phosphated, oxidized starch and use of same as dispersant in aqueous solutions and coating for lithography. 4,841,040, Cl. 536-105.000.

Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, to Mitutoyo Mfg. Co., Ltd. Photoelectric type displacement detecting instrument. 4,840,488, Cl. 356-374.000.

Kabigen AB: *See*—
Gafvelin, Guro; Carlquist, Mats; and Mutt, Viktor, 4,840,785, Cl. 424-9.000.

Kabushiki Kaisha Frontier: *See*—
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Ishikawa, Tetsushi; Okabe, Masato; and Kato, Hiroyasu, 4,840,142, Cl. 119-17.000.

Kabushiki Kaisha Itoki: *See*—
Ishikawa, Tetsushi; Okabe, Masato; and Kato, Hiroyasu, 4,840,142, Cl. 119-17.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kitagawa, Hiroshi, 4,840,099, Cl. 84-1.010.

Kabushiki Kaisha Maki Seisakusho: *See*—
Sato, Yasuhiro; and Haraguchi, Kazuo, 4,840,265, Cl. 198-446.000.

Kabushiki Kaisha Sigma: *See*—
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakuso: *See*—
Yamashita, Tatsuo; and Ishiguro, Kazuyoshi, 4,840,401, Cl. 280-804.000.

Kabushiki Kaisha Toshiba: *See*—
Awazu, Koichi, 4,841,454, Cl. 364-521.000.
Furuyama, Tohru, 4,841,483, Cl. 365-189.070.
Hagino, Hideyuki; and Kusano, Takahiro, 4,841,179, Cl. 307-520.000.
Iijima, Yasuo, 4,841,131, Cl. 235-380.000.
Kashiwagi, Kazuhiko, 4,840,506, Cl. 400-621.000.
Kohyama, Mitsuaki, 4,841,335, Cl. 355-245.000.
Masuda, Eiji; Fujita, Yasuhiko; and Takasaki, Terufumi, 4,841,567, Cl. 379-355.000.
Murakami, Teruo; and Seo, Naobumi, 4,841,502, Cl. 369-13.000.
Murata, Mitsuru, 4,841,275, Cl. 338-195.000.
Nakajima, Shunichi; and Izawa, Koji, 4,841,375, Cl. 353-280.000.
Noguchi, Tatsuo, 4,841,346, Cl. 357-23.100.
Saito, Kazuo; Saito, Toshihiko; and Kishimoto, Ken, 4,840,558, Cl. 431-1.000.
Shigemitsu, Fumiaki; Usuda, Kinya; and Nomaki, Tatsuo, 4,840,874, Cl. 430-296.000.
Ueno, Masaji; and Masuoka, Hideaki, 4,841,172, Cl. 307-443.000.
Umezu, Kenji; and Sano, Tetsuo, 4,840,220, Cl. 165-1.000.
Yamada, Koji; and Sakamoto, Noriaki, 4,840,037, Cl. 62-199.000.
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, 4,841,538, Cl. 372-58.000.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, 4,840,941, Cl. 514-59.000.

Kabushiki Kaisha Yaita Seisakusho: *See*—
Yaita, Shigeru, 4,840,510, Cl. 401-149.000.

Kabushiki Kaisha Yokoyama Seisakusho: *See*—
Yokoyama, Michihiro, 4,839,952, Cl. 29-159.200.

Kadoya, Norio; Kawachi, Jun; and Miyazawa, Keiji, to Yamatake-Honeywell Co. Ltd. Two-wire transmitter. 4,841,296, Cl. 340-870.160.

Kage, Kouzou, to NEC Corporation. Privacy signal transmission system. 4,841,571, Cl. 380-31.000.

Kaieda, Shozo: *See*—
Fukae, Kensuke; and Kaieda, Shozo, 4,841,334, Cl. 355-271.000.

Kainuma, Masakuni: *See*—
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Kaji, Atsuhiko: *See*—
Shiozaki, Ryozi; Kaji, Atsuhiko; Saijo, Hiroyuki; and Deguchi, Katsuhiko, 4,840,746, Cl. 252-174.250.

Kajimura, Takashi: *See*—
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.

Kajita, Ryota; Esaki, Hiroshi; and Shimazaki, Hirato, to Bridgestone Corporation. Set of gold clubs. 4,840,380, Cl. 273-77.00A.

Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, to Matsushita Electric Industrial Co., Ltd. Program recording scheduling apparatus using an optical reader. 4,841,132, Cl. 235-472.000.

Kajiwara, Toshiyuki: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Kakisawa, Hiroshi; Kusumi, Takenori; and Ohno, Nobuo, to Sumitomo Chemical Company, Limited. Algicidal composition. 4,840,658, Cl. 71-67.000.

Kakuda, Masayuki: *See*—
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.

Kakumoto, Shigeru; Sumi, Tatsuo; and Kurisu, Tetsuo, to Hitachi, Ltd.; and Hitachi Software Engineering Co., Ltd. Method of and apparatus for automatically reading 5 band arrayal pattern. 4,841,443, Cl. 364-413.010.

Kakumu, Ichizo: *See*—
Ishida, Takeo; Hagiwara, Hiroshi; and Kakumu, Ichizo, 4,839,992, Cl. 51-5.00D.

Kakutani, Yoshimi: *See*—
Nejigaki, Tatuo; and Kakutani, Yoshimi, 4,840,769, Cl. 422-26.000.

Kaletka, Martin: *See*—
Michael, Wolfgang; and Kaletka, Martin, 4,840,055, Cl. 72-345.000.

Kallabis, Manfred; and Gombert, Guido. Cementless endoprosthesis. 4,840,633, Cl. 623-23.000.

Kallergis, Michael, to Deutsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Propeller whose blades are provided with slats. 4,840,540, Cl. 416-223.00A.

Kalmanek, Charles R., Jr.: *See*—
Delaney, Robert H.; Kalmanek, Charles R., Jr.; and Restrick, Robert C., III, 4,841,295, Cl. 340-825.500.

Kalnes, Tom N.; and James, Robert B., Jr., to UOP. Process for treating a temperature-sensitive hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product. 4,840,721, Cl. 208-57.000.

Kaluschke, Thomas: *See*—
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.

Kalwar, Klaus. Method of manufacturing a corona discharge electrode and a corona discharge electrode produced by the method. 4,841,409, Cl. 361-230.000.

Kambayashi, Koji; Okamoto, Nobuyuki; and Kawanami, Kenichiro, to Sony Corporation. Interface circuit for adapting a multi-scan monitor to receive color display data from various types of computers. 4,841,289, Cl. 340-703.000.

Kamegamori, Masayuki: *See*—
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, 4,841,330, Cl. 355-245.000.

Kamei, Eiichi; and Namba, Hideaki, to Nippondenso Co., Ltd. Apparatus for controlling vehicle speed. 4,840,245, Cl. 180-179.000.

Kamerling, Marc A.: *See*—
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.

Kameyama, Tatsuya: *See*—
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.

Kamijo, Tetsuhide: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.

Kamimura, Testuro: *See*—
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.

Kaminsky, Walter; and Buschermohle, Maria, to Hoechst Aktiengesellschaft. Process for the preparation of a 1-olefin stereoblock polymer. 4,841,004, Cl. 526-160.000.

Kamisada, Toshimasa; and Saito, Akira, to Hitachi, Ltd. Apparatus and method for detecting focus error signal and tracking error signal in an optical disk system. 4,841,509, Cl. 369-46.000.

Kamitakahara, Atushi; and Ogi, Keiji, to Konishiroku Photo Industry Co., Ltd. Direct positive image-forming process. 4,840,879, Cl. 430-406.000.

Kammerer, Manfred: *See*—
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, 4,841,280, Cl. 340-706.000.

Kammoto, Yoshiaki; and Saito, Masanori, to Ricoh Company, Ltd. Device for reading a color image from an original document with reciprocating filter. 4,841,358, Cl. 358-75.000.

Kampner, Stanley L. Hip prosthesis. 4,840,632, Cl. 623-22.000.

Kamstrup-Larsen, Jorgen, to Coloplast A/S. Method for producing an absorption body, notably for use in cases of urinary incontinence in women. 4,840,692, Cl. 156-252.000.

Kamyr AB: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,840,047, Cl. 68-181.00R.

Kanamaru, Masanobu: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Kandler, Wilfried H. K.: *See*—
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Somemiya, Akiyoshi; and Hirobe, Kazushi, 4,840,984, Cl. 524-394.000.

Kaneiwa, Shinji: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.

Kaneko, Eiji: *See*—
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, 4,841,538, Cl. 372-58.000.
Kaneko, Kyoichi, to Daiwa Seiko, Inc. Apparatus for measuring drag-force of fishing reel. 4,840,327, Cl. 242-217.000.
Kaneko, Shoji; and Nakamura, Atsumi, to Somar Corporation. Front plate for X-ray cassettes. 4,841,558, Cl. 378-182.000.
Kanesaka, Junichiro: *See*—
Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, 4,840,849, Cl. 428-419.000.
Kaneshige, Yousuke: *See*—
Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, 4,840,849, Cl. 428-419.000.
Kang, Yoon M.: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.
Kansai Paint Co., Ltd.: *See*—
Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, 4,840,715, Cl. 204-181.100.
Kao Corporation: *See*—
Iwasaki, Tetsuji; and Fukui, Yoshio, 4,840,942, Cl. 514-120.000.
Shiozaki, Ryozi; Kaji, Atsuhiko; Saijo, Hiroyuki; and Deguchi, Katsuhiko, 4,840,746, Cl. 252-174.250.
Kapa, Prasad K., to Sandoz Pharm. Corp. 6-substituted-4-hydroxy-tetrahydropyran-2-ones. 4,841,071, Cl. 549-214.000.
Karl Heesemann Maschinenfabrik GmbH & Co. KG: *See*—
Heesemann, Juergen, 4,839,994, Cl. 51-165.720.
Karl, Rupert; and Becker, Rudolf, to Schubert & Salzer Maschinenfabrik. Process and device for the servicing of work stations of spinning or doubling machines by means of a plurality of service units capable of travelling alongside the work stations. 4,840,022, Cl. 57-263.000.
Karle, Anton, to Robert Bosch GmbH. Fuel injection pump. 4,840,155, Cl. 123-300.000.
Karnebogen, Karl W.: *See*—
Johnson, Paul; and Karnebogen, Karl W., 4,840,115, Cl. 98-2.030.
Karspeck, Milan: *See*—
Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, 4,841,455, Cl. 364-525.000.
Karton, Boaz: *See*—
Ladan, Uri; Karton, Boaz; and Klipper, Aron, 4,840,105, Cl. 89-1.130.
Karunaratne, Arjuna R.: *See*—
Barney, Jonathan A.; and Karunaratne, Arjuna R., 4,841,221, Cl. 323-320.000.
Kasai, Naoya; Shima, Hisaharu; and Tsujimura, Kazuya, to Osaka Soda Co., Ltd. Process for producing optically active dichloropropanol using microorganism. 4,840,907, Cl. 435-253.300.
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, to Canon Kabushiki Kaisha. Developing device accommodating apparatus and image forming apparatus and developing device. 4,841,329, Cl. 355-245.000.
Kasamura, Toshirou: *See*—
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.
Kasanami, Tohru: *See*—
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.
Kase, Masao: *See*—
Nozu, Shinsaku; Kase, Masao; and Yamashita, Masakazu, 4,841,518, Cl. 369-270.000.
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, to Toyota Jidosha Kabushiki Kaisha. Device for controlling 4wd vehicle central differential restriction device according to front and rear wheels rotational speed difference, and method of operation thereof. 4,840,247, Cl. 180-249.000.
Kashihara, Yuji: *See*—
Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, 4,840,092, Cl. 74-869.000.
Kashiwa, Norio; Toyota, Akinori; and Kioka, Mamoru, to Mitsui Petrochemical Industries, Ltd. Process for producing olefin polymers. 4,841,003, Cl. 526-125.000.
Kashiwabara, Hiroshi: *See*—
Kimura, Akira; Kashiwabara, Hiroshi; and Fujiyama, Hirohisa, 4,841,116, Cl. 219-73.100.
Kashiwagi, Hiroshi: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Kashiwagi, Kazuhiko, to Kabushiki Kaisha Toshiba. Printer. 4,840,506, Cl. 400-621.000.
Kashyap, Raman: *See*—
Winter, Christopher S.; and Kashyap, Raman, 4,840,461, Cl. 350-346.000.
Kasprick, Jon J.: *See*—
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kersh, Douglas W., 4,841,456, Cl. 364-550.000.
Kastron, Valeria V.: *See*—
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,840,326, Cl. 242-199.000.
Katagiri, Toshiyuki; and Marukado, Kazuhisa, to NEC Home Electronics Ltd. Cyclic noise reducing apparatus. 4,841,366, Cl. 358-167.000.
Katahira, Masayuki, to Nippon Seiko Co., Ltd. Ball screw apparatus. 4,840,077, Cl. 74-424.8NA.
Katakura, Kageyoshi: *See*—
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.
Kataoka, Keiji, to Hitachi, Ltd. Light modulating device array. 4,840,447, Cl. 350-96.140.
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 4,840,865, Cl. 430-114.000.
Kato, Hirohiko: *See*—
Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, 4,840,877, Cl. 430-350.000.
Kato, Hiroshi: *See*—
Ito, Akio; and Kato, Hiroshi, 4,840,509, Cl. 401-198.000.
Kato, Hiroyasu: *See*—
Ishikawa, Tetsushi; Okabe, Masato; and Kato, Hiroyasu, 4,840,142, Cl. 119-17.000.
Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Industrial robot control device. 4,841,210, Cl. 318-568.240.
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control device for 4WD torque distribution clutch providing stabilized pressure characteristics. 4,840,263, Cl. 192-109.00F.
Kato, Ryoki: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Kato, Seiichi: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Kato, Toshikazu: *See*—
Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, 4,840,986, Cl. 524-436.000.
Kato, Yasuo; Ochiai, Isao; Watanabe, Yoshio; and Murayama, Seiichi, to Hitachi, Ltd. Plasma X-ray source. 4,841,556, Cl. 378-119.000.
Kato, Yoshiaki; and Hihara, Toshio, to Mitsubishi Chemical Industries Limited. Diazo colors and dyeing method using the same. 4,841,029, Cl. 534-634.000.
Kato, Yoshiaki: *See*—
Oshidari, Toshikazu; Hattori, Noboru; and Kato, Yoshiaki, 4,840,261, Cl. 192-106.00F.
Katoh, Katsunori: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Katoh, Taisei: *See*—
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, 4,840,926, Cl. 501-134.000.
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., to Minnesota Mining and Manufacturing Company. Polypyridinium. 4,841,021, Cl. 528-407.000.
Katsuyama, Toshio: *See*—
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.
Katyal, Anil: *See*—
Campbell, John S.; Baker, Brian N.; and Katyal, Anil, 4,840,774, Cl. 423-79.000.
Katz, Egon; Bossenmaier, Alban; and Barmbilla, Luigi, to Daimler-Benz Aktiengesellschaft. Impact protection device for the occupants of motor vehicles with a filter to clean the driving gas. 4,840,397, Cl. 280-739.000.
Kawabata, Kouji: *See*—
Ishimoto, Kenji; and Kawabata, Kouji, 4,840,557, Cl. 425-555.000.
Kawabe, Taketoshi; and Ito, Ken, to Nissan Motor Co., Ltd. Vehicle steer angle control system based on mathematical model. 4,840,389, Cl. 280-91.000.
Kawachi, Jun: *See*—
Kadoya, Norio; Kawachi, Jun; and Miyazawa, Keiji, 4,841,296, Cl. 340-870.160.
Kawaguchi, Ltd.: *See*—
Kosaka, Norindo; and Yamaguchi, Chikatoshi, 4,841,364, Cl. 358-101.000.
Kawai Musical Instrument Manufacturing Co., Ltd.: *See*—
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, 4,840,104, Cl. 84-437.000.
Kawakatsu, Satoshi: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Kawakita, Kiyoshi: *See*—
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, 4,841,414, Cl. 361-424.000.
Kawamura, Masahiko: *See*—
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.
Kawanami, Kenichiro: *See*—
Kambayashi, Koji; Okamoto, Nobuyuki; and Kawanami, Kenichiro, 4,841,289, Cl. 340-703.000.

Kawasaki Kasei Chemicals Ltd.: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Kawasaki, Masahiro; and Sato, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having interchangeable lenses. 4,841,322, Cl. 354-400.000.

Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 4,840,888, Cl. 430-567.000.

Kawasaki Steel Corporation: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.

Kawasaki, Yushi, to Citizen Watch Co., Ltd. Double gimbal magnetic head supporting mechanism for a floppy disk drive. 4,841,396, Cl. 360-104.000.

Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, to Sumitomo Chemical Company, Limited. Process for preparing phenyl- and naphthylazo-aminonaphthol sulphonic acids. 4,841,027, Cl. 534-599.000.

Kayane, Yutaka; Otake, Katsumasa; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Reactive dye having both monochlorotriazinyl and vinylsulfone type reactive groups. 4,841,031, Cl. 534-638.000.

Kazawa, Tohru: *See*—
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.

Kazewych, Bohdan: *See*—
Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., 4,839,990, Cl. 49-352.000.

Kazuhiko, Takai, to Sanden Corporation. Automatic expansion valve for a refrigeration circuit. 4,840,039, Cl. 62-244.000.

Kazusaka, Shoji: *See*—
Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.

Kearns, Michael J.; and Comer, Michael J., to Boehringer Mannheim GmbH. Process for culturing biological material. 4,840,905, Cl. 435-240.250.

Kelley, Thomas J. Surfboard traction bar. 4,840,590, Cl. 441-74.000.

Kelsey, Donald R., to Amoco Corporation. Substantially linear monomeric composition and liquid crystal polymeric compositions derived therefrom. 4,841,009, Cl. 528-75.000.

Kemeny, George A.; and Deis, Daniel W., to Westinghouse Electric Corp. Electromagnetic launcher with post-firing energy recovery for slow or rapid fire operation. 4,841,181, Cl. 310-12.000.

Kemp, James: *See*—
Voorhees, John L.; and Kemp, James, 4,840,144, Cl. 119-96.000.

Kempf, Paul S., to Paul Stuart Kempf and Pilar Moreno Family Trust. 3-dimensional optical viewing system. 4,840,455, Cl. 350-137.000.

Kennametal Inc.: *See*—
Bartley, Donald L., 4,840,360, Cl. 269-48.100.

Kennedy, Alan W.: *See*—
Middlin, Bruce; Locke, Norman; and Kennedy, Alan W., 4,840,710, Cl. 204-12.000.

Kenney, William H.: *See*—
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.

Kentek Information Systems, Inc.: *See*—
Fukae, Kensuke; and Kaieda, Shozo, 4,841,334, Cl. 355-271.000.

Kenyeres, Istvan; and Koch, Lehel, to Innofinance Altalanos Innovacios Penzintezet. Process for contacting gases with liquids. 4,840,751, Cl. 261-36.100.

Keramaris, Nikolaos: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.

Kerimov, Oleg M.: *See*—
Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M., 4,841,537, Cl. 372-55.000.

Kerr, George T.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.

Kersh, Douglas W.: *See*—
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kersh, Douglas W., 4,841,456, Cl. 364-550.000.

Kessler, Christoph: *See*—
Grosskopf, Rudiger; and Kessler, Christoph, 4,840,901, Cl. 435-91.000.

Kessler, Hartmut, to Siemens Aktiengesellschaft. Electrical capacitors having low capacitance tolerances and method for the manufacture thereof. 4,841,411, Cl. 361-323.000.

Khattak, Chandra P.; White, Vernon E.; Schmid, Frederick; and Wohlgemuth, John H., to Ghemini Technologies. Gallium arsenide crystal growth. 4,840,699, Cl. -//.000.

Kia Motors Corporation: *See*—
Hong, Bahk, 4,840,427, Cl. 297-346.000.

Kido, Koichi: *See*—
Nishimoto, Naomichi; Okauchi, Takeshi; and Kido, Koichi, 4,841,383, Cl. 360-33.100.

Kikkawa, Sadanobu: *See*—
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,032, Cl. 534-642.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,033, Cl. 534-642.000.

Kikuchi, Akio, to Nifco, Inc. Fastener for fastening elongate object. 4,840,334, Cl. 248-73.000.

Kikuchi, Keiichi: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Kikuchi, Riichi: *See*—
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-111.810.

Kikuchi, Sadatoshi: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.

Kimball, Charles H.: *See*—
Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., 4,840,056, Cl. 73-1.00H.

Kimenis, Agris A.: *See*—
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.

Kimisawa, Toshihide, to Nifco Inc. Device for mounting window pane. 4,840,001, Cl. 52-208.000.

Kimura, Akira; Kashiwabara, Hiroshi; and Fujiyama, Hirohisa, to Nippon Steel Corporation. Process for automatic fusion welding of rails. 4,841,116, Cl. 219-73.100.

Kimura, Fumihiko: *See*—
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.

Kimura, Masao: *See*—
Okada, Yoshimi; Kimura, Masao; and Okubo, Kazuo, 4,841,216, Cl. 322-10.000.

Kimura, Tadashi: *See*—
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.

Kimura, Tomoaki: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Kimura, Toshiyuki: *See*—
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Kimura, Yasuo, to NEC Corporation. Method and apparatus for detecting a track and focus errors in an optical head. 4,841,508, Cl. 361-45.000.

Kinbara, Kouji, to NEC Corporation. Method of fabricating a multichip package. 4,840,924, Cl. 437-189.000.

Kingston, Samuel C., to Unisys Corporation. Digital phase shifter. 4,841,552, Cl. 377-43.000.

Kinoshita, Kazunori: *See*—
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, 4,841,414, Cl. 361-424.000.

Kioka, Mamoru: *See*—
Kashiwa, Norio; Toyota, Akinori; and Kioka, Mamoru, 4,841,003, Cl. 526-125.000.

Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, to Fanuc Ltd. Method of reconfiguration of storage areas in an apparatus for cheating NC tapes. 4,841,432, Cl. 364-191.000.

Kishi, Tomomi: *See*—
Izumi, Akira; Kishi, Tomomi; and Niwa, Hideo, 4,840,417, Cl. 294-65.500.

Kishi, Yutaka: *See*—
Yasuda, Kazuhito; and Kishi, Yutaka, 4,840,916, Cl. 437-3.000.

Kishimoto, Ken: *See*—
Saito, Kazuo; Saito, Toshihiko; and Kishimoto, Ken, 4,840,558, Cl. 431-1.000.

Kishimoto, Shinji: *See*—
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, 4,840,180, Cl. 128-661.080.

Kishino, Takao; and Mizohata, Tadashi, to Futaba Denshi Kogyo K.K. Fluorescent display device. 4,841,194, Cl. 313-496.000.

Kiso, Yoshiaki: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.

Kissei Pharmaceutical Co., Ltd.: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.

Kita, Noriyasu; and Goto, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Light-sensitive composition. 4,840,869, Cl. 430-191.000.

Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, to Hitachi, Ltd. Magnetoresistive magnetic head including zirconium sheet film. 4,841,399, Cl. 360-113.000.

Kitagawa, Hiroshi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,840,099, Cl. 84-1.010.

Kitagawa, Masayuki; and Tanaka, Makoto, to Daiichi Seiyaku Co., Ltd. Benzopyran derivatives. 4,841,076, Cl. 549-401.000.

Kitakami, Osamu: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo;

Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.

Kitamura, Terukiyo: *See*—
Murakami, Hideto; and Kitamura, Terukiyo, 4,840,255, Cl. 188-73.350.

Kitamura, Yasuhiro, to Kyocera Corporation. Artificial hip joint. 4,840,630, Cl. 623-22.000.

Kitayama, Yoshinobu, to Sumitomo Electric Industries, Ltd. Composite overhead stranded conductor. 4,840,453, Cl. 350-96.230.

Kiuchi, Seiji: *See*—
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.

Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, to Pioneer Electronic Corporation. Random playing method for disk player. 4,841,506, Cl. 369-32.000.

Klayman, Arnold I., to Hughes Aircraft Company. Stereo synthesizer. 4,841,572, Cl. 381-17.000.

Kleine, Werner, to Gebruder Heller GmbH. Werkzeugfabrik. Drill bit for hand drills. 4,840,519, Cl. 408-226.000.

Klemm, Gunter, to Ing. Gunter Klemm Spezialunternehmen fur Bohrtechnik. Superposed drilling device. 4,840,238, Cl. 175-92.000.

Kleykamp, Donald L. Railroad hatch cover having an integral holddown bar therefor. 4,840,126, Cl. 105-377.000.

Klinedinst, Paul W.: *See*—
Johnston, Brian J.; and Klinedinst, Paul W., 4,840,366, Cl. 271-9.000.

Klipper, Aron: *See*—
Ladan, Uri; Karton, Boaz; and Klipper, Aron, 4,840,105, Cl. 89-1.130.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Rubin, Gerhard; and Bleckmann, Hugo, 4,840,315, Cl. 241-24.000.

Kluth, Joachim: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Knape, Michael, to Sendvac M. Knape GmbH & Co. Maschinen und Anlagen KG. Process for producing formed and labelled three dimensional plastic articles. 4,840,691, Cl. 156-245.000.

Knapp, Stephen L. Simple, high performance digital data transmission system and method. 4,841,549, Cl. 375-111.000.

Knight, Glenn L., Jr.: *See*—
Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., 4,840,026, Cl. 60-271.000.

Knit-Rite, Inc.: *See*—
Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., 4,840,635, Cl. 623-36.000.

Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, to Kuraray Co., Ltd.; and Kuraray Plasmon Data Systems Co., Ltd. Production of optical recording medium. 4,840,873, Cl. 430-273.000.

Kobayashi, Hideo; and Arai, Yoshio, to Tachi-S Co., Ltd. Head rest adjusting device. 4,840,428, Cl. 297-408.000.

Kobayashi, Hidetoshi: *See*—
Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, 4,840,877, Cl. 430-350.000.
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.

Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, to Ricoh Company, Ltd.; Kobayashi, Hiroshi; and Machida, Haruhiko. Method of manufacturing masked semiconductor laser. 4,840,922, Cl. 437-129.000.

Kobayashi, Keiji; and Urabe, Takashi, to Toshiba Silicone Co., Ltd. Release coating-forming composition. 4,841,006, Cl. 528-15.000.

Kobayashi, Masatsune: *See*—
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Kobayashi, Seishichi: *See*—
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.

Kobayashi, Susumu; and Satoh, Kazumasa, to Terumo Corporation. Portable pump for infusing medicine into a living body. 4,840,620, Cl. 604-246.000.

Kobayashi, Tatsuo: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Kobayashi, Tetsuo: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Kobayashi, Tetuo; and Hirai, Shoichi, to Nippon Cable System, Inc. Driving device employed in a window regulator. 4,840,080, Cl. 74-501.50R.

Kobayashi, Toshio: *See*—
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.

Kobayashi, Toshitaka: *See*—
Harada, Hidetoshi; Chihara, Satoshi; Suginaka, Yutaka; Suido, Shigeko; and Kobayashi, Toshitaka, 4,840,814, Cl. 426-580.000.

Kobler, Ingo; and Petersen, Godber, to MAN ROLAND Druckmaschinen AG. Apparatus for receiving and transporting folded sheets or sheet packages. 4,840,365, Cl. 270-54.000.

Kobori, Tomohiro: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Koch, Lehel: *See*—
Kenyeres, Istvan; and Koch, Lehel, 4,840,751, Cl. 261-36.100.

Koch, Rudolf, to Siemens Aktiengesellschaft. Switched Current source. 4,841,222, Cl. 323-311.000.

Koga, Masahiro: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,841,091, Cl. 558-441.000.

Kogure, Yoshio: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Kohyama, Mitsuaki, to Kabushiki Kaisha Toshiba. Recording apparatus and method. 4,841,335, Cl. 355-245.000.

Koito Seisakusho Co., Ltd.: *See*—
Ohishi, Kazutami, 4,841,419, Cl. 362-226.000.

Kojima, Takao; and Yamada, Tetsuyo, to NGK Spark Plug Co., Ltd. Reinforced plate-like sintered bodies. 4,840,854, Cl. 428-698.000.

Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, to Hitachi Ltd.; and Hitachi Device Engineering Co., Ltd. Exposure apparatus. 4,841,315, Cl. 354-1.000.

Kokan Kako Co., Ltd.: *See*—
Nakamura, Masanobu, 4,840,053, Cl. 72-58.000.

Koken Co., Ltd.: *See*—
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.

Kokkeler, Franciscus; Fioroli, Mario; Riaman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., to U.S. Philips Corporation. Microwave oven with improved defrosting mode. 4,841,111, Cl. 219-10.55B.

Kokuryu, Yuji: *See*—
Nishiki, Hiroyuki; and Kokuryu, Yuji, 4,840,408, Cl. 285-62.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Yamazaki, Katsuyuki, 4,841,522, Cl. 370-64.000.

Kolb, Albrecht: *See*—
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.

Kolb, Eugen, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Tensioning arrangement for the top cover of a motor vehicle. 4,840,419, Cl. 296-108.000.

Koleske, Joseph V.; and Kwiatkowski, George T., to Union Carbide Corporation. Blends, of cyclic vinyl ether containing compounds and epoxides. 4,840,978, Cl. 522-169.000.

Komamura, Tawara: *See*—
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.

Komatsu Seiren Co., Ltd.: *See*—
Murakami, Shuichi; and Shimano, Yasunao, 4,840,817, Cl. 427-45.100.

Komori, Shinji: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Komurasaki, Satosi, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for an internal combustion engine. 4,840,158, Cl. 123-419.000.

Konczykowska, Agnieszka: *See*—
Mulawka, Jan; Konczykowska, Agnieszka; and Bon, Michel, 4,841,263, Cl. 333-173.000.

Kondo, Kenji: *See*—
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.

Kondo, Masafumi: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, 4,841,533, Cl. 372-45.000.

Kondo, Masahide: *See*—
Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.

Kondo, Ryuji: *See*—
Shizukuishi, Makoto; and Kondo, Ryuji, 4,841,348, Cl. 357-30.000.

Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, to Hitachi Ltd.; and Hitachi Medical Corp. Ultrasonic beam former. 4,841,491, Cl. 367-103.000.

Kondo, Takumi: *See*—
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.

Kondo, Tomonobu: *See*—
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.

Kondou, Tsutomu, to Mitsubishi Chemical Industries Limited; and Nikken Chemicals Company, Limited. Method of dehydrating foods in melted erythritol. 4,840,804, Cl. 426-103.000.

Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, to Hitachi, Ltd. Semiconductor laser device. 4,841,531, Cl. 372-43.000.

Kone Elevator GmbH: *See*—
Hakala, Harri, 4,841,426, Cl. 363-37.000.

Kongo, Takeshi: *See*—
Orii, Akira; and Kongo, Takeshi, 4,841,206, Cl. 388-828.000.

Konica Corporation: *See*—
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, 4,841,337, Cl. 355-157.000.
Koshizuka, Kunihiro; and Abe, Takao, 4,840,848, Cl. 428-413.000.
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, 4,840,883, Cl. 430-553.000.
Matsunawa, Masahiko; and Yamamoto, Hiroyuki, 4,841,361, Cl. 358-80.000.

Konings, Johan W. M. E.: *See*—
Farhangi, Hassan; and Konings, Johan W. M. E., 4,841,513, Cl. 369-59.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,841,332, Cl. 355-251.000.
Hiratsuka, Seiichiro; and Matsunawa, Masahiko, 4,841,377, Cl. 358-283.000.
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.
Kamitakahara, Atushi; and Ogi, Keiji, 4,840,879, Cl. 430-406.000.
Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000.
Kita, Noriyasu; and Goto, Kiyoshi, 4,840,869, Cl. 430-191.000.
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, 4,841,330, Cl. 355-245.000.
Uesawa, Yutaka; and Morimoto, Isamu, 4,840,889, Cl. 430-597.000.
Watanabe, Yoshikazu; and Tanaka, Motoaki, 4,840,881, Cl. 430-512.000.
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.
Yamamoto, Hiroyuki; and Matsunawa, Masahiko, 4,841,376, Cl. 358-282.000.

Konno, Chisato: *See*—
Tsuji, Michiru; Konno, Chisato; and Saji, Miyuki, 4,841,479, Cl. 364-900.000.

Konrad, Eugen: *See*—
Husemeyer, Hans; Mager, Herbert; and Konrad, Eugen, 4,840,639, Cl. 8-410.000.

Kontoghiorghes, George: *See*—
Hider, Robert C.; Kontoghiorghes, George; and Silver, Jack, 4,840,958, Cl. 514-348.000.

Kooijmans, Petrus G.: *See*—
Van Iperen, Roeland; Van Der Mark, Johannes M.; and Kooijmans, Petrus G., 4,840,979, Cl. 523-404.000.

Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt. Oxadiazole-alkyl-purine derivatives useful as antitussive agents. 4,840,949, Cl. 514-234.200.

Kormoczy, Peter: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Koromzay, Tibor, to BBC Brown Boveri AG. Method for lengthening the blading aerofoil of turbo machinery blades. 4,841,117, Cl. 219-76.100.

Korosi, Jeno: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Kosaka, Norindo; and Yamaguchi, Chikatoshi, to Kawaguchi, Ltd. System for confirming the release of a molded article in an injection molding apparatus and for determining the quality of the article. 4,841,364, Cl. 358-101.000.

Kosc, Wieslaw: *See*—
Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, 4,840,390, Cl. 280-250.100.

Kose, Junichi; and Seto, Nobuyuki, to Fuji Photo Film Co., Ltd. Circulating liquid flow detecting apparatus in a machine for automatically processing light-sensitive material. 4,841,321, Cl. 354-324.000.

Koseki, Hiroyuki, to Bridgestone Corporation. Heavy duty low profile pneumatic radial tires. 4,840,213, Cl. 152-454.000.

Koshizuka, Kunihiro; and Abe, Takao, to Konica Corporation. Thermal transfer recording medium. 4,840,848, Cl. 428-413.000.

Koshizuka, Kunihiro: *See*—
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.

Kosugi, Akira: *See*—
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, 4,841,330, Cl. 355-245.000.

Kosugi, Toru: *See*—
Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, 4,841,524, Cl. 370-112.000.

Kosuzume, Hiroshi: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Kot, Edward J.: *See*—
Lindberg, Chris E.; Kot, Edward J.; and Chicoye, Etzer, 4,840,802, Cl. 426-16.000.

Kotani, Matahira; Hayashi, Motohiko; and Yamanoue, Masafumi, to Sharp Kabushiki Kaisha. Image processing method. 4,841,374, Cl. 358-280.000.

Kotani, Tsutomu: *See*—
Takahashi, Minoru; and Kotani, Tsutomu, 4,840,183, Cl. 128-715.000.

Kottmair, Nikolaus: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.

Kotzab, Werner; and Zielke, Horst, to Daimler-Benz Aktiengesellschaft. Valve-actuating lever for internal combustion engines. 4,840,150, Cl. 123-90.390.

Koura, Seigo: *See*—
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.

Kouzai, Tetsuo: *See*—
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, 4,840,014, Cl. 53-432.000.

Kovach, Ronald M.: *See*—
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.

Kovacs, Gabor: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., to Mead Corporation, The. Microcapsule imaging system having improved dynamic range. 4,840,866, Cl. 430-138.000.

Kowarski, Szloma: *See*—
Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., 4,840,894, Cl. 435-7.000.

Kowite, William J.; and Oestreicher, Stephen L., to Rhone Poulenc Nederlands B.V. Plant growth regulator dispersions. 4,840,660, Cl. 71-86.000.

Koyama, Noritoshi: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Koyama, Satoshi: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Koyama, Takeshi; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Apparatus for detecting the focus adjusted state of an objective optical system. 4,841,326, Cl. 354-406.000.

Koyama, Tsunehiro, to Mitsubishi Denki Kabushiki Kaisha. Bipolar logic circuit. 4,841,173, Cl. 307-456.000.

Koyanagi, Kimiyuki: *See*—
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.

Koyano, Toshihide: *See*—
Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, 4,841,278, Cl. 340-908.100.

Kozuki, Susumu; and Satoh, Keiji, to Canon Kabushiki Kaisha. Reproducing apparatus for intermittently driving recording medium. 4,841,380, Cl. 360-10.200.

Kraemer, Manfred: *See*—
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.

Kramer, Hans: *See*—
Vollhardt, Frohmut; and Kramer, Hans, 4,840,145, Cl. 122-379.000.

Kraner, James L.: *See*—
Dougherty, Lawrence W.; and Kraner, James L., 4,840,596, Cl. 445-30.000.

Krasuski, Marek; Gregoire, Jean-Pierre; and Gerbaud, Claude, to SMH Alcatel. Label dispenser and a franking machine equipped with said dispenser. 4,840,696, Cl. 156-353.000.

Kraus, Rainer, to Siemens Aktiengesellschaft. Integrable evaluating circuit. 4,841,180, Cl. 307-530.000.

Krause, Norbert: *See*—
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000.

Krautsack, Richard G., to Comark Merchandising, Inc. Mounting clip for dispensing sheet-like items. 4,839,977, Cl. 40-658.000.

Kreifels, Jerry A.; and Hoekstra, George, to Intel Corporation. Leakage verification for flash EPROM. 4,841,482, Cl. 365-185.000.

Krenke, Vincent G.: *See*—
Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., 4,840,137, Cl. 116-227.000.
Krepski, Larry R.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.
Kress, Kenneth: *See*—
Chu, Mosi; Graziano, Anthony; and Kress, Kenneth, 4,840,504, Cl. 400-213.000.
Kriebel, Manfred: *See*—
Grunewald, Gerhard; and Kriebel, Manfred, 4,840,648, Cl. 55-44.000.
Kristen, Rolf: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.
Krouskop, Thomas A.: *See*—
Muller, Walter; and Krouskop, Thomas A., 4,840,634, Cl. 623-24.000.
Krouzkevitch, Benjamin; and Litvinenko, Alexander. Hand-carried tool for cutting plaster-like material. 4,839,966, Cl. 30-475.000.
Krueger, Hans; Lamprecht, Herbert, deceased; by Lamprecht, Thekla, heir; by Lamprecht, Simon, heir; and Tiemann, Wilhelm, to Siemens Aktiengesellschaft. Gas laser arrangement. 4,841,540, Cl. 372-86.000.
Krueger, Hans: *See*—
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.
Krueger, Leroy A.: *See*—
Swix, Scott R.; and Krueger, Leroy A., 4,841,291, Cl. 340-725.000.
Krupp Polysius AG: *See*—
Unland, Georg; and Driemeier, Gunter, 4,840,561, Cl. 432-106.000.
Kubo, Kanji, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension system for automobiles. 4,840,396, Cl. 280-690.000.
Kubo, Motonobu: *See*—
Tamaru, Sinji; and Kubo, Motonobu, 4,841,005, Cl. 526-245.000.
Tamaru, Sinji; and Kubo, Motonobu, 4,841,093, Cl. 560-65.000.
Kubo, Shinji: *See*—
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Kubota, Hitoshi: *See*—
Nakagawa, Toru; Kubota, Hitoshi; and Sakurai, Yasuo, 4,841,430, Cl. 364-167.010.
Kubota, Katuhisa, to Fujitsu Limited. Master slave latch circuit with race prevention. 4,841,168, Cl. 307-272.200.
Kubota, Shinji; Hirosawa, Kazutoyo; and Yoshida, Tomio, to Matsushita Electric Industrial Co., Ltd. Optical disk apparatus with an erase checking function. 4,841,512, Cl. 369-54.000.
Kubota, Tetsuhiro: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.
Kudo, Hiroaki: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.
Kuehne, Martin, to University of Vermont & State Agricultural College. Synthesis of vinblastine and vincristine type compounds. 4,841,045, Cl. 540-478.000.
Kuehnert, Hans-Guenter E., to Hoechst Aktiengesellschaft; and ELTI Apparatebau und Elektronik GmbH. Apparatus for laminating a film under pressure and heat. 4,840,698, Cl. 156-485.000.
Kuenemund, Ronald; and Noll, Tobias, to Siemens Aktiengesellschaft. Matrix times matrix multiplier. 4,841,469, Cl. 364-754.000.
Kuhar nee Kurthy, Maria: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Kuhn, Manfred: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.
Kuhn, Uwe: *See*—
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.
Kuhns, James J.: *See*—
Henry, Samuel B.; and Kuhns, James J., 4,840,437, Cl. 305-10.000.
Kukimoto, Takashi, to Bridgestone Corporation. Heavy duty pneumatic radial tires. 4,840,210, Cl. 152-209.00A.
Kulander, Hans, to MRT System Aktiebolag. Treatment of mercurial waste. 4,840,314, Cl. 241-24.000.
Kumabe, Hisao; and Susaki, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser. 4,841,532, Cl. 372-45.000.
Kumamura, Tawara: *See*—
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.
Kumashiro, Kenji: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Kumazaki, Hiroshi: *See*—
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.
Kume, Masafumi: *See*—
Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, 4,840,715, Cl. 204-181.100.
Kume, Tsutomu: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,841,461, Cl. 364-572.000.
Kume, Yuichiro: *See*—
Doi, Kunio; and Kume, Yuichiro, 4,841,555, Cl. 378-99.000.
Kummer, Fernand. Escapement mechanism for upright piano. 4,840,101, Cl. 84-247.000.
Kummer, Karl T., to Honeywell Inc. Apparatus and method for detection of an open thermocouple in a process control network. 4,841,286, Cl. 340-653.000.
Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, to Fuji Photo Film Co., Ltd.; and Oji-National Co., Ltd. Desensitizing gum for lithographic printing plate comprising a polybasic and monoester of polysaccharide. 4,840,875, Cl. 430-309.000.
Kunichika, Kenji: *See*—
Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, 4,841,320, Cl. 354-299.000.
Kunitz, Friedrich-Wilhelm: *See*—
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.
Kuniya, Keiichi: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.
Kuno, Hideyuki: *See*—
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.
Kuno, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Coil device. 4,841,269, Cl. 335-299.000.
Kuno, Sachiko: *See*—
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, 4,840,941, Cl. 514-59.000.
Kuraray Co., Ltd.: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.
Kuraray Plasmon Data Systems Co., Ltd.: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.
Kureha Kogyo Kabushiki Kaisha: *See*—
Iwasaki, Takao; and Horikosi, Katsumi, 4,841,019, Cl. 528-388.000.
Kurihara, Kazumasa, to Nifco, Inc. Synthetic resin rivet. 4,840,522, Cl. 411-44.000.
Kurihara, Toshihiko; and Funabashi, Tadashi, to Pioneer Electronic Corporation. Disk clamping device. 4,841,517, Cl. 369-270.000.
Kurisu, Tetsuo: *See*—
Kakumoto, Shigeru; Sumi, Tatsuo; and Kurisu, Tetsuo, 4,841,443, Cl. 364-413.010.
Kuroe, Akio: *See*—
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.
Kurokawa, Yasuyoshi, to Sharp Kabushiki Kaisha. Electronic typewriter ribbon lift-up apparatus. 4,840,505, Cl. 400-697.100.
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic pump assembly associated with accumulator. 4,840,544, Cl. 417-254.000.
Kuroyanagi, Shigeru: *See*—
Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, 4,841,447, Cl. 364-431.070.
Kuroyanagi, Yoshimitsu: *See*—
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.
Kurozumi, Seizi: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,841,091, Cl. 558-441.000.
Kurpiella, Hubert: *See*—
Schmalfuas, Harald; Kurpiella, Hubert; and Schneider, Bernhard, 4,841,139, Cl. 250-223.00R.
Kurtz, John L.: *See*—
Bowser, C. Frederick; and Kurtz, John L., 4,840,377, Cl. 273-31.000.
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, to Sumitomo Chemical Company, Limited. Iodopropargyl carbamate derivative, a method for its production and fungicidal compositions containing it as an active ingredient. 4,841,088, Cl. 558-417.000.
Kusano, Kenji: *See*—
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.
Kusano, Takahiro: *See*—
Hagino, Hideyuki; and Kusano, Takahiro, 4,841,179, Cl. 307-520.000.
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, to Canon Kabushiki Kaisha. Optical device. 4,840,473, Cl. 350-484.000.

Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, to Matsushita Electric Industrial Co., Ltd. Purifier of diesel particulates in exhaust gas. 4,840,028, Cl. 60-303.000.

Kusumi, Takenori: *See—*
Kakisawa, Hiroshi; Kusumi, Takenori; and Ohno, Nobuo, 4,840,658, Cl. 71-67.000.

Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, to Canon Kabushiki Kaisha. Image forming apparatus with developing device accommodating means. 4,841,336, Cl. 355-245.000.

Kusumoto, Toshihiko: *See—*
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.

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DeLuca, Hector F.; Kutner, Andrzej; and Schnoes, Heinrich K., 4,841,038, Cl. 536-27.000.

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Kuwano, Yukinori: *See—*
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.

Kuwatsuka, Shunichiro: *See—*
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.

Kvaerner-Eureka A/S: *See—*
Skarstad, Torgeir, 4,840,535, Cl. 415-168.200.

Kvaser Consultant, AB: *See—*
Fredriksson, Lars-Berno, 4,841,450, Cl. 364-468.000.

Kwiatkowski, George T.: *See—*
Koleske, Joseph V.; and Kwiatkowski, George T., 4,840,978, Cl. 522-169.000.

Kyler, Arlene. Display and dispensing apparatus. 4,839,976, Cl. 40-47.000.

Kyocera Corporation: *See—*
Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, 4,841,545, Cl. 375-1.000.
Kitamura, Yasuhiro, 4,840,630, Cl. 623-22.000.
Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, 4,841,278, Cl. 340-908.100.

L. Schuler GmbH: *See—*
Michael, Wolfgang; and Kaletka, Martin, 4,840,055, Cl. 72-345.000.

La Telemecanique Electrique: *See—*
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, 4,841,106, Cl. 200-462.000.

Labate, Michael D. Externally replaceable stirring plug for molten metal vessels. 4,840,356, Cl. 266-265.000.

LaBate, Micheal D. Stirring brick with shaped gas volume control openings. 4,840,354, Cl. 266-218.000.

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LaCount, Dale F.: *See—*
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.

LaCour, Colette: *See—*
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.

Ladan, Uri; Karton, Boaz; and Klipper, Aron, to Israel Aircraft Industries Ltd. Mine field clearing apparatus. 4,840,105, Cl. 89-1.130.

Ladd, Judith A.: *See—*
Husted, Eric F.; and Ladd, Judith A., 4,840,775, Cl. 423-150.000.

Lagache, Remi: *See—*
Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, 4,840,203, Cl. 139-453.000.

Lagerwall, Sven T.: *See—*
Clark, Noel A.; and Lagerwall, Sven T., 4,840,463, Cl. 350-350.00S.

Lai, John T.: *See—*
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.

Lai, Shui T.: *See—*
Chai, Bruce H.; Lai, Shui T.; and Long, Margaret N., 4,841,530, Cl. 372-41.000.

Laing, David: *See—*
Hawkins, Ross H.; Laing, David; and Bedington, Bryan C., 4,841,359, Cl. 358-76.000.

L'air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Hay, Leon, 4,840,647, Cl. 55-26.000.

Lakin, Bryan L.; and McDaniel, William P. W., to Fasco Industries, Inc. Heat sink and mounting arrangement therefor. 4,840,222, Cl. 165-47.000.

Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., to General Motors Corporation. Apparatus and method of a power spring counterbalance for tape drive window regulators. 4,839,990, Cl. 49-352.000.

Lampe, Donald R.; Mentzer, Mark A.; and Naviasky, Eric H., to Westinghouse Electric Corp. Cross-tie memory system. 4,841,480, Cl. 365-87.000.

Lamprecht, Herbert: *See—*
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.

Lamprecht, Herbert, deceased: *See—*
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

Lamprecht, Simon, heir: *See—*
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

Lamprecht, Thekla, heir: *See—*
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

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Lancella, Attilio, to Connei S.p.A. Socket contact for contact devices of the pin and socket type. 4,840,588, Cl. 439-851.000.

Landherr, Gordon G.: *See—*
Baker, Ralph E.; and Landherr, Gordon G., 4,840,415, Cl. 294-1.100.

Landre, Bernard, to Universal Technic. Current-measuring device. 4,841,237, Cl. 324-127.000.

Lang nee Rihmer, Zsuzsanna: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Lang, Robert: *See—*
Hartmann, Gunter; Swoboda, Ralf; and Lang, Robert, 4,839,954, Cl. 29-235.000.

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Lange, Bernard: *See—*
Hoying, John F.; and Lange, Bernard, 4,840,358, Cl. 267-140.100.

Lange International S.A.: *See—*
Dodge, David J., 4,839,973, Cl. 36-121.000.

Lantor (UK) Limited: *See—*
Flynn, Nigel; and Clark, Nigel, 4,840,840, Cl. 428-283.000.

LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., to Mobil Oil Corporation. Method for preparing acid stable zeolites and high silica zeolites prepared by it. 4,840,930, Cl. 502-79.000.

Larkin, Mark E.; and Ogden, John E., to Abbott Laboratories. Piercing pin transfer device. 4,840,621, Cl. 604-29.000.

Larson, Ralph I., Jr.: *See—*
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,840,225, Cl. 165-104.330.

Laser Science, Inc.: *See—*
Javan, Ali, 4,841,529, Cl. 372-32.000.

Lasercheck Limited: *See—*
Gabriel, David; Audus, David; and Strange, Norman, 4,840,490, Cl 356-375.000.

Laska, Eugene M.: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,840,962, Cl. 514-406.000.

Latka, Franz, to Alfred Teves GmbH. Safety relay circuit for switching on electric systems of automotive vehicles. 4,841,158, Cl. 307-10.100.

Lauer, Herbert: *See—*
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, 4,840,736, Cl. 210-727.000.

Laurel Bank Machines Co., Ltd.: *See—*
Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, 4,841,144, Cl. 250-239.000.
Uehara, Kazuhiro, 4,840,368, Cl. 271-162.000.

Laurence Harold A., to Laurence & Laurence, Inc. Shooter's hat having flexible side blinder attachments. 4,839,924, Cl. 2-10.000.

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Laurence Harold A., 4,839,924, Cl. 2-10.000.

Laut, Jack R. Tilt-responsive display case alarm. 4,841,285, Cl. 340-571.000.

Lauzon, Robert: *See—*
Jones, Elwyn D.; Lauzon, Robert; and Wetter, Bruno, 4,840,609, Cl. 493-28.000.

Lawford, Hugh G., to George Weston Limited. Continuous process for ethanol production by bacterial fermentation using pH control. 4,840,902, Cl. 435-161.000.

Lawlor, Patrick M.; and DeMar, Lawrence E. Pinball machine. 4,840,375, Cl. 273-121.00A.

Lay, Bor-Cherng; and Jou, Shoei-Sheng. Limiter switching apparatus. 4,841,162, Cl. 307-112.000.

Lay, Kurt; and Sailer, Erwin, to Daimler-Benz Aktiengesellschaft. Arrangement for repairing stone impact damages at windshields made of multi-layer safety glass. 4,840,551, Cl. 425-12.000.

Leary, Jeffry J.: *See—*
Adams, Craig W.; Leary, Jeffry J.; and Rosenberg, Martin, 4,840,892, Cl. 435-5.000.

LeBegue, Maurice K.; and Wilson, Henry E., to Baker International Corporation. Continuous miner with duct assembly. 4,840,432, Cl. 299-64.000.

Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, to Vexcel Corporation. Reseau apparatus for photogrammetry devices. 4,841,455, Cl. 364-525.000.

Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, to Matra Manurhin Defense. Support device for the mechanism of a revolver. 4,839,978, Cl. 42-65.000.

LeCour, Richard M.: *See*—
Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.

Lee, Chi-long: *See*—
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., 4,840,796, Cl. 424-448.000.

Lee, Chun D.: *See*—
Wild, Leslie; and Lee, Chun D., 4,840,996, Cl. 525-193.000.

Lee, Edward, to Solv-X Inventions Ltd. Power back scrubbing and flushing system for cooling systems. 4,840,223, Cl. 165-95.000.

Lee, Fred C.: *See*—
Tabisz, Wojciech A.; and Lee, Fred C., 4,841,220, Cl. 323-282.000.

Lee, Henry J. Female condom device. 4,840,624, Cl. 604-349.000.

Lee, Julia L.: *See*—
Crivello, James V.; and Lee, Julia L., 4,840,977, Cl. 522-25.000.

Lee, Mark C.: *See*—
Elleman, Daniel D.; Allen, James L.; and Lee, Mark C., 4,840,496, Cl. 374-124.000.

Lee, Sae D., to Zenith Electronics Corporation. Cathode ray tube contrast enhancement systems. 4,841,372, Cl. 358-247.000.

Lee, Scott: *See*—
Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, 4,841,455, Cl. 364-525.000.

Lee, Ta J.; and Hoffman, William F., to Merck & Co., Inc. Intermediates and processes for 6-carboxy HMG-CoA reductase inhibitors. 4,841,074, Cl. 549-292.000.

Lee, Wha-Joon, to American Telephone and Telegraph Company. Printed circuit board fabrication technique. 4,841,500, Cl. 368-120.000.

Lee, Wha-Joon: *See*—
Hsue, Ching-Wen; and Lee, Wha-Joon, 4,841,240, Cl. 324-158.00P.

Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., to Borden, Inc. Method of preserving color of vegetable pasta products. 4,840,808, Cl. 426-270.000.

Lehmann, Volker: *See*—
Foell, Helmut; and Lehmann, Volker, 4,841,239, Cl. 324-158.00R.

Lehoczky, Kalman N. Interpolar body for cooling salient-type rotor by ventilation. 4,840,538, Cl. 416-96.00A.

Leiber, Heinz, to Robert Bosch GmbH. Vehicle brake system having an anti-skid apparatus. 4,840,434, Cl. 303-113.000.

Leiber, Heinz; and Ohnemuller, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Method for monitoring the operations of an electromechanical control system that ensures the adhesion of wheels of a motor vehicle. 4,841,446, Cl. 364-426.020.

Leibhard, Erich: *See*—
Bisping, Heinz; Leibhard, Erich; and Mauthe, Peter, 4,840,524, Cl. 411-82.000.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Apparatus for detecting foreign bodies in a fiber tuft mass. 4,839,943, Cl. 19-80.00R.

Leitner, S.p.A.: *See*—
Pabst, Otto, 4,840,088, Cl. 74-661.000.

Lejus Medical Aktiebolag: *See*—
Appelgren, Curt H.; Eskilsson, Eva C.; and Uvdal, Jonas P., 4,840,799, Cl. 424-493.000.

Lekholm, Anders; Fahlstroem, Ulf; and Groothoff, Hermann, to Siemens Aktiengesellschaft. Implantable multi-pole coaxial lead. 4,840,186, Cl. 128-784.000.

Lem, Steven. Telephone VCR control. 4,841,562, Cl. 379-104.000.

Lembens, Helmut: *See*—
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, 4,840,367, Cl. 271-160.000.

Lenox, Joseph J.: *See*—
Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., 4,840,747, Cl. 252-301.40R.

Lentini, Salvatore; and Patti, Giuseppe, to Italtel Societa Italiana Telecomunicazioni s.p.a. Monitoring circuit for control means and selective breakaway means in modular supply systems. 4,841,161, Cl. 307-85.000.

Leo Pharmaceutical Products Ltd.: *See*—
Godtfredsen, Wagn O.; and von Daehne, Welf, 4,840,944, Cl. 514-195.000.

Leonard, Henri, to Micro-Mega. Device for maintaining a boring tool in a vibratory dental instrument. 4,840,566, Cl. 433-127.000.

Lerat, Bernard, to Commisariat A L'Energie Atomique. System for locating an object in space. 4,840,445, Cl. 350-6.800.

Leufert, Walter P.; and Miller, David L., to AMP Incorporated. Cable jacket strain relief adapter assembly. 4,840,581, Cl. 439-472.000.

Levacher, Friedrich K.: *See*—
Federmann, Helmut; Levacher, Friedrich K.; and Noack, Georg, 4,840,452, Cl. 350-96.230.
Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, 4,840,480, Cl. 356-32.000.

Leveen, Eric G.: *See*—
Leveen, Harry H.; Leveen, Robert F.; and Leveen, Eric G., 4,840,939, Cl. 514-25.000.

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Leveen, Robert F.: *See*—
Leveen, Harry H.; Leveen, Robert F.; and Leveen, Eric G., 4,840,939, Cl. 514-25.000.

Lever Brothers Company: *See*—
Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., 4,840,810, Cl. 426-312.000.

Levie, Mark W., to LK Mfg. Skimmer/separation ladle. 4,839,965, Cl. 30-324.000.

Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, to Honeywell, Incorporated. Analog to digital conversion by measuring the ratio of RC time constants. 4,841,458, Cl. 364-557.000.

Levine, Robert A., to Atlantic Richfield Company. Oil spill recovery apparatus. 4,840,729, Cl. 210-170.000.

Lew, Hyok S. Convective attenuation flowmeter. 4,840,071, Cl. 73-861.380.

Lewis, Armis L.: *See*—
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 4,841,417, Cl. 362-206.000.

Lewis, Larry N.: *See*—
Gross, David C.; Lewis, Larry N.; and Haig, Connie L., 4,840,974, Cl. 521-85.000.

Ley, Gregor: *See*—
Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, 4,840,990, Cl. 524-504.000.

Liberman, Barnet L., to Liberman, Barnet L.; Chamberlain, Winthrop D.; Fedele, Joseph; and Fedele, Brian, a part interest. Method of freezing vital body fluids. 4,840,034, Cl. 62-64.000.

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Hill, Hugh A. O.; and Libor, Susan I., 4,840,893, Cl. 435-6.000.

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Hauke, Dieter; and Zelle, Edgar, 4,841,187, Cl. 310-171.000.
Wulff, Hans-Jurgen, 4,841,266, Cl. 335-16.000.

Lichtfuss, Gerhardt E., to Sundstrand Corp. Self-aligning journal bearing. 4,840,498, Cl. 384-213.000.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,840,007, Cl. 53-137.000.
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Lieske, Normen; and Seichter, Werner, to Siemens Aktiengesellschaft. Method and arrangement for testing mega-bit memory modules with arbitrary test patterns in a multi-bit test mode. 4,841,525, Cl. 371-21.000.

Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., to Eastman Kodak Company. High temperature method for the production of ribavirin. 4,840,898, Cl. 435-87.000.

Lift Tech International Inc.: *See*—
Verbos, Stephen P., 4,841,215, Cl. 318-757.000.

Lighting Technology, Inc.: *See*—
Groh, Allen R., 4,841,422, Cl. 362-294.000.

Lii, Jong T. Faucet structure. 4,840,351, Cl. 251-230.000.

Lilly Industries Limited: *See*—
Hunter, William H., 4,841,056, Cl. 546-68.000.

Lillywhite, M. James; and Horn, Michael J., to Baker Hughes. Double shell thickener. 4,840,283, Cl. 220-5.00A.

Lim, Esther H.: *See*—
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., 4,841,343, Cl. 355-77.000.

Lindberg, Chris E.; Kot, Edward J.; and Chicoye, Etzer, to Miller Brewing Company. Process for brewing beer while enhancing yeast growth. 4,840,802, Cl. 426-16.000.

Linde Aktiengesellschaft: *See*—
Grunewald, Gerhard; and Kriebel, Manfred, 4,840,648, Cl. 55-44.000.

Lindley, Martin K.: *See*—
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

Lines, Jerry L., to MiTek Industries, Inc. Apparatus for making wooden I-beams. 4,840,207, Cl. 144-41.000.

Linsky, Gary; Cunningham, Timothy; and Pines, Eli, to Johnson & Johnson Patient Care, Inc. Heparin-containing adhesion prevention barrier and process. 4,840,626, Cl. 604-364.000.

Litt, Timothe, to Digital Equipment Corporation. Braille encoding method and display system. 4,840,567, Cl. 434-114.000.

Littlehales, William J., to American Bionetics, Inc. Electroblotting technique for transferring specimens from a polyacrylamide electrophoresis or like gel onto a membrane. 4,840,714, Cl. 204-180.100.

Litvinenko, Alexander: *See*—
Krouzkevitch, Benjamin; and Litvinenko, Alexander, 4,839,966, Cl. 30-475.000.

Live International Co., Ltd.: *See*—
Tominaga, Yasunori, 4,840,812, Cl. 426-488.000.

LK Mfg.: *See*—
Levie, Mark W., 4,839,965, Cl. 30-324.000.

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Hakim, Shafik J.; Locher, Mark R.; Nieng, Kenneth Y.; and Vagnozzi, Barbara A., 4,841,433, Cl. 364-200.000.

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Locke, Norman: *See*—
Middlin, Bruce; Locke, Norman; and Kennedy, Alan W., 4,840,710, Cl. 204-12.000.

Logothetis, Eleftherios M.; and Soltis, Richard E., to Ford Motor Company. Oxides of nitrogen detector. 4,840,913, Cl. 436-116.000.

Logsdon, Hubert E. Golf green viewing apparatus. 4,839,968, Cl. 33-286.000.

Loher Aktiengesellschaft: *See*—
Rosinnes, Meir; Stadler, Hugo; and Strunz, Siegfried, 4,841,218, Cl. 322-24.000.
Lohr & Bromkamp GmbH: *See*—
Welschof, Hans-Heinrich; and Beier, Rudolf, 4,840,087, Cl. 74-713.000.
Lomangino, Michael, to United Technologies Corporation. Radio frequency power modification without phase shift. 4,841,262, Cl. 333-81.00R.
Lombardi, Paolo: *See*—
Buzzetti, Franco; di Salle, Enrico; and Lombardi, Paolo, 4,840,943, Cl. 514-177.000.
Lombardo, James W. Illuminated dart. 4,840,383, Cl. 273-420.000.
Lombardo, Leo, to Moore Business Forms, Inc. Fold-over mailer with side-open return envelope with slittable edge. 4,840,306, Cl. 229-73.000.
Lonardo, Robert. Combination arm splint and finger support means. 4,840,168, Cl. 128-77.000.
Lonergan, Kevin J., to Digital Equipment Corporation. Lossless over-current sensing circuit for voltage regulator. 4,841,219, Cl. 323-274.000.
Long, Alden O., Jr., to AMP Incorporated. Harness-making machine having improved cable guide. 4,839,962, Cl. 29-749.000.
Long, Margaret N.: *See*—
Chai, Bruce H.; Lai, Shui T.; and Long, Margaret N., 4,841,530, Cl. 372-41.000.
Longo, Giovanni: *See*—
Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., 4,841,095, Cl. 560-115.000.
L'Oreal: *See*—
Grollier, Jean F., 4,840,787, Cl. 424-52.000.
Grollier, Jean-Francois; and Fourcadier, Chantal, 4,840,790, Cl. 424-70.000.
Lorena, Emilio: *See*—
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, 4,841,565, Cl. 379-413.000.
Lott, Thomas M. Hold and dial accessory for telephone instrument. 4,841,566, Cl. 379-352.000.
Lou, Perry W., to Brooktree Corporation. System for compensating for offset voltages in comparators. 4,841,252, Cl. 330-9.000.
Lovett, Eva G.: *See*—
Bellos, Thomas J.; and Lovett, Eva G., 4,840,748, Cl. 252-344.000.
Lovgren, Einar. System for installing wood door jambs and hardwood door trim. 4,840,002, Cl. 52-213.000.
Loy, Fernand R.; Perrin, Jean-Claude; and Rollin, Joel, to U.S. Philips Corporation. Device for correcting distortion. 4,840,465, Cl. 350-421.000.
LP COM: *See*—
Lubarsky, Andre; and Pospisil, Richard E., 4,841,437, Cl. 364-200.000.
LTV Aerospace & Defense Co.: *See*—
Ehrenhalt, Dan; and Giles, George R., 4,841,258, Cl. 332-9.00R.
Freitag, Douglas W., 4,840,763, Cl. 264-65.000.
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Lubrizol Corporation, The: *See*—
Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., 4,840,687, Cl. 149-2.000.
Luc-Co., Inc.: *See*—
Moody, Leonardo, 4,840,045, Cl. 63-12.000.
Lucas, Gordon H.; and Giles, Randy K., to Hearthstone Builders, Inc. Construction log and associated corner construction. 4,840,003, Cl. 52-233.000.
Lucas Industries Public Limited Company: *See*—
Birch, Barry, 4,841,238, Cl. 324-144.000.
Harrison, Anthony W., 4,840,257, Cl. 188-196.00D.
Lucchesi, Benedict R.: *See*—
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.
Luciani, Bernard, to Cibie Projecteurs. Additional headlight for use on a motor vehicle in conjunction with a dipped headlight. 4,841,423, Cl. 362-304.000.
Lueers, Wilbrand, to Siemens Aktiengesellschaft. Apparatus for rail operation comprising a long-stator linear motor. 4,840,125, Cl. 104-292.000.
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A. 2,6-dimethyl-3,5-dimethoxycarbonyl-4-(5'-trimethylsilyl-2'-furyl)-1,4-dihydropyridine. 4,841,054, Cl. 546-14.000.
Lunardon, Gian F.: *See*—
Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., 4,841,095, Cl. 560-115.000.
Lunderman, William; and Seidler, David, to Revlon, Inc. Compact case with irreversible hinge. 4,840,288, Cl. 220-334.000.
Luong, Minh P.: *See*—
Martin, Andre ; and Luong, Minh P., 4,841,149, Cl. 250-330.000.
Lupoli, Peter J.: *See*—
Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., 4,840,137, Cl. 116-227.000.
Lusher, David M.: *See*—
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.
Lutron Electronics Co., Inc.: *See*—
Barney, Jonathan A.; and Karunaratne, Arjuna R., 4,841,221, Cl. 323-320.000.
Lyding, Joseph W., to University of Illinois, The Board of Trustees of The. Variable temperature scanning tunneling microscope. 4,841,148, Cl. 250-306.000.
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., to Bethlehem Steel Corporation. Process for chemical stabilization of heavy metal bearing dusts and sludges as EAF dust. 4,840,671, Cl. 106-85.000.
M.I.M. Technology Marketing Limited: *See*—
Middlin, Bruce; Locke, Norman; and Kennedy, Alan W., 4,840,710, Cl. 204-12.000.
Maag, Henry H. Four-bar rigid-drive variable resistance pectoral fly machine. 4,840,373, Cl. 272-134.000.
Maaz, Bassam. Gastric tube positioning method. 4,840,614, Cl. 604-53.000.
Machida, Haruhiko: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.
Mack, Gerhard: *See*—
Pawlowski, Georg; Hultsch, Guenter; and Mack, Gerhard, 4,840,868, Cl. 430-155.000.
MacLeod, Donald J.; Peterson, Miles L.; and Nowark, Charles G., Jr., to Seagate Technology, Inc. Spindle motor for a disc drive. 4,841,393, Cl. 360-98.070.
Macor, Richard J. Multiple socket and multiple socket wrench. 4,840,094, Cl. 81-185.000.
Maddali, Vijay K.: *See*—
Dishner, Bryan W.; Maddali, Vijay K.; and Dhyanchand, P. John, 4,841,202, Cl. 318-14.000.
Madsen, John J. Disposable one-piece seat liner. 4,840,841, Cl. 428-286.000.
Maeba, Yukio; and Igashira, Kiyoteru, to Murata Manufacturing Co., Ltd. High-voltage power supply apparatus. 4,841,425, Cl. 363-21.000.
Maeda, Koichi: *See*—
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.
Maeda, Masaya, to Canon Kabushiki Kaisha. Head shifting device. 4,841,397, Cl. 360-105.000.
Maeda, Satoru: *See*—
Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, 4,841,370, Cl. 358-227.000.
Maeda, Tsutomu: *See*—
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.
Maeda, Yasunori: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Maekawa, Yoshihiro, to Mazda Motor Corporation. Front body structure of a motorcar. 4,840,423, Cl. 296-194.000.
MAG Instrument, Inc.: *See*—
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 4,841,417, Cl. 362-206.000.
Magatti, Charles V.: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.
Mager, Herbert: *See*—
Husemeyer, Hans; Mager, Herbert; and Konrad, Eugen, 4,840,639, Cl. 8-410.000.
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., to MAG Instrument, Inc. Tailcap switch-focus flashlight. 4,841,417, Cl. 362-206.000.
Magnetic Peripherals Inc.: *See*—
Craft, David C., 4,841,395, Cl. 360-103.000.
Mowry, Greg S., 4,841,398, Cl. 360-113.000.
Mai, M. Jane; and Hargrave, Maxine. Auxiliary toilet seat. 4,839,929, Cl. 4-254.000.
Maier, Lawrence C., to Simmonds Precision Products, Inc. Apparatus for the ratiometric measurement of a quantity of liquid in a tank. 4,841,227, Cl. 324-61.00R.
Maijers, Andries C.; Weekamp, Johannus W.; Van Den Ackerveken, Antonius C. J. C.; and Brink, Jan, to U.S. Philips Corporation. Method of accommodating an object which carries current during operation in a synthetic resin housing and a combination of an object which carries current during operation and a synthetic resin housing. 4,841,410, Cl. 361-306.000.
Maillard, Philippe: *See*—
Martin, Alain; and Maillard, Philippe, 4,840,096, Cl. 82-113.000.
Maire, Francoise: *See*—
Joulain, Daniel; Racine, Philippe; and Maire, Francoise, 4,840,792, Cl. 424-76.100.
Majumdar, Gourab, to Mitsubishi Denki Kabushiki Kaisha. Modified conductivity modulated MOSFET. 4,841,345, Cl. 357-23.400.
Makimoto, Mitsuo: *See*—
Ohba, Motoi; and Makimoto, Mitsuo, 4,841,255, Cl. 331-14.000.
Makino, Masamori: *See*—
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.

Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, to Fuji Photo Film Co., Ltd. Photoconductive composition having an azaazulenium salt. 4,840,862, Cl. 430-75.000.
Makino, Shigeo, to Bridgestone Corporation. Pneumatic tire having asymmetrical groove cross section. 4,840,211, Cl. 152-209.00R.
Makita, Fujio: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.
Malmsten, Erkki, to Rauma-Repola Oy. Method for controlling an oxygen bleaching. 4,840,703, Cl. 162-49.000.
Man Gutehoffnungshuette GmbH: *See*—
Vollhardt, Frohmut; and Kramer, Hans, 4,840,145, Cl. 122-379.000.
Man - Roland Druckmaschinen AG: *See*—
Schneider, Eckhard, 4,840,364, Cl. 270-38.000.
MAN ROLAND Druckmashinen AG: *See*—
Kobler, Ingo; and Petersen, Godber, 4,840,365, Cl. 270-54.000.
Mancel, James D.: *See*—
Raiskums, Olaf B.; and Mancel, James D., 4,840,689, Cl. 156-217.000.
Mandel, Paul M., Jr.: *See*—
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,840,669, Cl. 106-19.000.
Hughes, Cleveland L.; Williams, Timothy N.; and Mandel, Paul M., Jr., 4,840,670, Cl. 106-19.000.
Mann, James A., Jr.; and Haselton, E. Fletcher, to Teknekron Infoswitch Corporation. Plug-in card module. 4,840,570, Cl. 439-74.000.
Mannen, Bryce L.: *See*—
Vijay, Tumkur R.; and Mannen, Bryce L., 4,840,215, Cl. 157-1.000.
Manowitz, Milton: *See*—
Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, 4,841,063, Cl. 548-213.000.
Manzi, Brian P.: *See*—
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.
Marek, James C.: *See*—
Doherty, Joseph P.; and Marek, James C., 4,840,765, Cl. 376-310.000.
Marmarosi nee Kellner, Katalin: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.
Marshall, Barry R., to Ambic Equipment Limited. Automatic milking apparatus. 4,840,141, Cl. 119-14.470.
Marshall, William W.; and Springer, Lamar D., to Spring Valley Associates, Inc. Pump and electric motor protector. 4,841,404, Cl. 361-30.000.
Marson, Albert U., to Michigan Bell Telephone Company. Modular plug identification tag. 4,840,582, Cl. 439-491.000.
Martin, Alain; and Maillard, Philippe, to Framatome & Cie. Device for machining chamfers on a free of a pipe. 4,840,096, Cl. 82-113.000.
Martin, Andre ; and Luong, Minh P., to Technologies Speciales Ingenierie-T.S.I. Device for detecting micro-leaks of gas by infrared radiations. 4,841,149, Cl. 250-330.000.
Marton, Jeno: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.
Marton, Lewis, to Atlas Air (Australia) Pty, Limited. Humidifier having a heating chamber with a continuously open drain and flushing outlet. 4,841,122, Cl. 219-273.000.
Marukado, Kazuhisa: *See*—
Katagiri, Toshiyuki; and Marukado, Kazuhisa, 4,841,366, Cl. 358-167.000.
Marukawa, Kiichi: *See*—
Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, 4,841,022, Cl. 528-487.000.
Marvel, Ray D. Medical safety device. 4,840,618, Cl. 604-187.000.
Masaki, Kazuo: *See*—
Adachi, Takeshi; and Masaki, Kazuo, 4,840,100, Cl. 84-1.190.
Maschinenfabrik Andritz Actiengesellschaft: *See*—
Senft, Helmut; and Hasenrath, Peter, 4,840,385, Cl. 277-53.000.
Maschinenfabrik Ravensburg AG: *See*—
Nussbaumer, Walter; and Beyrer, Karl-Heinz, 4,840,095, Cl. 82-117.000.
Maschino, Dale C., to General Motors Corporation. Odometer. 4,841,130, Cl. 235-96.000.
Mashimo, Akira: *See*—
Yamaguchi, Hirohisa; and Mashimo, Akira, 4,841,504, Cl. 369-32.000.
Masse, Roger. Impact hammer assembly for drilling rock. 4,840,235, Cl. 173-104.000.
Masters, Bradley S.: *See*—
Chung, Randall M.; and Masters, Bradley S., 4,841,174, Cl. 307-469.000.
Masuda, Eiji; Fujita, Yasuhiko; and Takasaki, Terufumi, to Kabushiki Kaisha Toshiba. Memory device. 4,841,567, Cl. 379-355.000.
Masuda, Yuichi; and Shimizu, Kozo, to Yoshida Kogyo K.K. Winding of flexible elongate material. 4,840,322, Cl. 242-67.10R.
Masuhara, Toshiaki: *See*—
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, to Konica Corporation. Light-sensitive silver halide color photographic material containing novel cyan coupler. 4,840,883, Cl. 430-553.000.
Masukawa, Toyoaki: *See*—
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.
Masuko, Takayuki; Suzuki, Norio; and Moriya, Kaoru, to Fujisu Limited. Polishing machine for ferrule of optical fiber connector. 4,839,993, Cl. 51-129.000.
Masuoka, Hideaki: *See*—
Ueno, Masaji; and Masuoka, Hideaki, 4,841,172, Cl. 307-443.000.
Matherne, Elmer L. Ceiling fan filter. 4,840,650, Cl. 55-385.100.
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., to Raytheon Company. Control sequencer with dual microprogram counters for microdiagnostics. 4,841,434, Cl. 364-200.000.
Mathews III, Marion J.; and Peoples, P. Robert, to Monsanto Company. Acrylonitrile dimerization process. 4,841,087, Cl. 558-363.000.
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., to Redken Laboratories, Inc. Hair-waving process. 4,840,791, Cl. 424-71.000.
Mathusima, Tokunori: *See*—
Nakamura, Shozo; Mathusima, Tokunori; and Tsuji, Kunio, 4,840,766, Cl. 376-378.000.
Mathys, Robert, to Robert Mathys Co. Artificial hip joint socket with hydraulic head support. 4,840,631, Cl. 623-22.000.
Maton, Michel M.: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.
Matra Manurhin Defense: *See*—
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,839,978, Cl. 42-65.000.
Matsubara, Kouji: *See*—
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Matsubayashi, Hiroshi: *See*—
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.
Matsuda, Hiroshi: *See*—
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.
Matsuda, Yasuo: *See*—
Miyazaki, Hideki; Onda, Kenichi; and Matsuda, Yasuo, 4,841,427, Cl. 363-62.000.
Matsudaira, Masaki: *See*—
Yoshida, Tsukasa; Ishige, Yoshio; Matsudaira, Masaki; and Takahashi, Tadashi, 4,840,807, Cl. 426-48.000.
Matsugu, Masakazu: *See*—
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.
Matsui, Sadayoshi: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.
Matsumoto, Hideyuki: *See*—
Nagai, Yoichiro; and Matsumoto, Hideyuki, 4,841,083, Cl. 556-430.000.
Matsumoto, Hiroshi: *See*—
Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, 4,840,875, Cl. 430-309.000.
Matsumoto, Keiji: *See*—
Yonezu, Kazuya; and Matsumoto, Keiji, 4,841,440, Cl. 364-200.000.
Matsumoto, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Apparatus from controlling amount of intake air to engine. 4,840,159, Cl. 123-585.000.
Matsumoto, Satoshi: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Matsumoto, Takashi, to NEC Corporation. Process for the growth of III-V group compound semiconductor crystal on a Si substrate. 4,840,921, Cl. 437-89.000.
Matsumoto, Takashi; Okada, Takashi; and Mizusaki, Sigenobu, to Japan Tobacco Inc. Desmosine derivatives and reagent for preparing artificial antigens. 4,841,055, Cl. 546-261.000.
Matsumura, Hiroyoshi: *See*—
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.
Matsumura, Mitsunobu: *See*—
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.

Matsumura, Yasushi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,840,805, Cl. 426-129.000.
Matsunaga, Mitsunobu: *See*—
Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, 4,840,116, Cl. 98-115.200.
Matsunaga, Ryozo: *See*—
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Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, to Nippon Seiko Kabushiki Kaisha. Electroconductive sliding apparatus. 4,841,408, Cl. 361-220.000.
Matsunawa, Masahiko; and Yamamoto, Hiroyuki, to Konica Corporation. Color image processing apparatus. 4,841,361, Cl. 358-80.000.
Matsunawa, Masahiko: *See*—
Hiratsuka, Seiichiro; and Matsunawa, Masahiko, 4,841,377, Cl. 358-283.000.
Yamamoto, Hiroyuki; and Matsunawa, Masahiko, 4,841,376, Cl. 358-282.000.
Matsuno, Kenji: *See*—
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.
Matsuo, Noritada: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,971, Cl. 514-721.000.
Matsuoka, Noriyuki, to Yamaichi Electric Mfg. Co., Ltd. Card connector. 4,840,575, Cl. 439-267.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Endo, Masayuki; Sasago, Masaru; and Ogawa, Kazufumi, 4,840,872, Cl. 430-273.000.
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Kubota, Shinji; Hirosawa, Kazutoyo; and Yoshida, Tomio, 4,841,512, Cl. 369-54.000.
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.
Mitani, Katsuaki; and Ishinaga, Hideki, 4,840,471, Cl. 350-438.000.
Nakagawa, Toru; Kubota, Hitoshi; and Sakurai, Yasuo, 4,841,430, Cl. 364-167.010.
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, 4,841,341, Cl. 355-43.000.
Ohba, Motoi; and Makimoto, Mitsuo, 4,841,255, Cl. 331-14.000.
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.
Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, 4,841,498, Cl. 369-32.000.
Yamada, Jiro; Haseoka, Masahide; and Obata, Isao, 4,841,503, Cl. 369-14.000.
Yoshikawa, Masanori; and Watanabe, Shuichi, 4,841,154, Cl. 250-317.100.
Matsushita Electronics Corporation: *See*—
Nakamura, Naoyuki; and Sangen, Masashi, 4,841,193, Cl. 313-318.000.
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, to Japan Tobacco, Inc. Method of preparing acetal or ketal. 4,841,075, Cl. 549-341.000.
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, to Minebea Co., Ltd. Resin-filled permanent-magnet stepping motor. 4,841,190, Cl. 310-257.000.
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, to Hitachi, Ltd. Electromagnetic bearing control apparatus. 4,841,212, Cl. 318-607.000.
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, to Shionogi & Co., Ltd. 9-(Substituted thio)-4H-pyrido[1,2,-A]pyrimidin-4-one derivatives. 4,840,953, Cl. 514-258.000.
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, to Kawasaki Kasei Chemicals Ltd. Catalyst for producing 1,4-naphthoquinone. 4,840,932, Cl. 502-202.000.
Matsuura, Yutaka: *See*—
Fujimura, Setsuo; Sagawa, Masato; and Matsuura, Yutaka, 4,840,684, Cl. 148-302.000.
Matsuzaki, Tetsuo: *See*—
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Matsuzawa, Soichiro, to NGK Insulators, Ltd. Magnetic head core comprising a monocrystaline ferrite. 4,841,400, Cl. 360-125.000.
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, to Daimler-Benz Aktiengesellschaft. Drive arrangement for a roll bar of motor vehicles. 4,840,398, Cl. 280-756.000.
Mattis, Donald J.: *See*—
Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., 4,840,137, Cl. 116-227.000.
Matza, Stephen D.; Ellington, William E.; and Fleming, Henry C., III, to Shell Oil Company. Controlling sulfide scavenger content of drilling fluid. 4,840,910, Cl. 436-30.000.
Maurer, Thomas: *See*—
Grottrup, Helmut; and Maurer, Thomas, 4,841,128, Cl. 235-491.000.
Mauthe, Peter: *See*—
Bisping, Heinz; Leibhard, Erich; and Mauthe, Peter, 4,840,524, Cl. 411-82.000.
May, Joe T.; and Casacia, Edward A., to Electronic Instrumentation and Technology, Inc. Measurement of the thickness of thin films. 4,841,156, Cl. 250-461.100.
Mayer, Perdy. Wave propagation structures for eliminating voltage surges and absorbing transients. 4,841,259, Cl. 333-17.200.
Mayer, Matthew E., to Holland Equipment Limited. Soil aerating equipment. 4,840,232, Cl. 172-21.000.
Mayer, Todd. String lock for acoustical instruments. 4,840,103, Cl. 84-297.00R.
Mayer, Udo: *See*—
Guentner, Andreas; Mayer, Udo; and Oberlinner, Andreas, 4,841,050, Cl. 544-150.000.
Mayfield, Robert L.: *See*—
Nusbaum, David B.; and Mayfield, Robert L., 4,840,604, Cl. 464-176.000.
Mayhew, John D., Jr. Pipe pressure sensor. 4,840,068, Cl. 73-730.000.
Mayr, Ernst, to Siemens Aktiengesellschat. Optical cable and method of manufacturing. 4,840,454, Cl. 350-96.230.
Mayr, Ernst: *See*—
Goetze, Werner; Mayr, Ernst; Oestreich, Ulrich; and Saller, Helmut, 4,839,970, Cl. 350-96.230.
Mazda Motor Corporation: *See*—
Asoh, Seiichi, 4,840,424, Cl. 296-204.000.
Hirabayashi, Shigefumi; and Nakajima, Toshio, 4,840,243, Cl. 180-140.000.
Maekawa, Yoshihiro, 4,840,423, Cl. 296-194.000.
McCarthy, Donald J., to Jacobs Manufacturing Company, The. Self-actuating keyless chuck. 4,840,387, Cl. 279-1.00K.
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., to Hughes Aircraft Company. Capacitive coupled power supplies. 4,841,429, Cl. 363-126.000.
McClanahan, Robert F.: *See*—
Washburn, Robert D.; and McClanahan, Robert F., 4,841,428, Cl. 363-75.000.
McConnell, Bernard E. Telescoping, sterile upright support assembly. 4,840,363, Cl. 269-328.000.
McConnell, Dale K. Door light. 4,839,989, Cl. 49-171.000.
McCullen, Sharon B.: *See*—
Chen, Nai Y.; and McCullen, Sharon B., 4,840,929, Cl. 502-74.000.
McDaniel, William P. W.: *See*—
Lakin, Bryan L.; and McDaniel, William P. W., 4,840,222, Cl. 165-47.000.
McDonald, Allan J., to Morton Thiokol, Inc. Multiple propellant solid rocket motor. 4,840,024, Cl. 60-39.461.
McDowell, Philip D.: *See*—
Heys, George, Jr.; Yandora, Andrew E.; and McDowell, Philip D., 4,841,412, Cl. 361-393.000.
McFarlane, Robert; and Walker, Stewart M., to Trading Post Restaurants Limited. Eating table with inset barbecue. 4,840,128, Cl. 108-50.000.
McGhan Medical Corporation: *See*—
Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,840,615, Cl. 604-93.000.
McKee, Graham E.: *See*—
Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, 4,840,990, Cl. 524-504.000.
McKinney, Gordon R.: *See*—
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., 4,840,952, Cl. 514-253.000.
McLaurin, Colin A.: *See*—
Brubaker, Clifford E.; and McLaurin, Colin A., 4,840,076, Cl. 74-143.000.
McMillin Wire & Plating, Inc.: *See*—
Stroh, Alvin L.; and Pilon, Terry C., 4,840,336, Cl. 248-97.000.
McWilliams Machinery Sales, Division of Bridgeport Machines Inc.: *See*—
Graeber, Richard N., 4,841,126, Cl. 219-69.200.
Mead Corporation, The: *See*—
Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.
Mechanical Technology Incorporated: *See*—
Chen, Hsiang M.; Eusepi, Martin W.; and Johnson, Robert E., 4,841,184, Cl. 310-90.500.
Medisense, Inc.: *See*—
Hill, Hugh A. O.; and Libor, Susan I., 4,840,893, Cl. 435-6.000.
Meguro, Satoshi: *See*—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., to Picker International, Inc. Transverse field limited localized coil for magnetic resonance imaging. 4,841,248, Cl. 324-318.000.
Mehrgardt, Soenke; and Ehret, Bernhard, to Deutsche ITT Industries GmbH. Nonrecursive digital filter. 4,841,463, Cl. 364-724.160.
Meier, Stefan: *See*—
De Man, Erik; and Meier, Stefan, 4,841,175, Cl. 307-475.000.

Meiji Milk Products Company Limited: *See*—
Harada, Hidetoshi; Chihara, Satoshi; Suginaka, Yutaka; Suido, Shigeko; and Kobayashi, Toshitaka, 4,840,814, Cl. 426-580.000.
Meisingset, Alf E.: *See*—
Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., 4,841,192, Cl. 310-337.000.
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, to Diehl GmbH & Co. Electronic acoustic signal emitter. 4,841,493, Cl. 367-140.000.
Meline, Harry R.; and Paulsen, Eric L., to MTS Systems Corporation. Capacitive extensometer with curved target surface. 4,841,226, Cl. 324-61.00R.
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., to Becton, Dickinson and Company. Method of constructing a blood flow conduit. 4,840,690, Cl. 156-242.000.
Melvin, Waymon A., Jr., to Westinghouse Electric Corp. Apparatus for controlling a switching amplifier. 4,841,281, Cl. 340-310.00A.
Memory Metals, Inc.: *See*—
Adnyana, Dewa N.; and Rogen, Neil E., 4,840,346, Cl. 251-1.300.
Mendez, Luis E.: *See*—
Berzin, Vel; and Mendez, Luis E., 4,840,231, Cl. 166-387.000.
Menlo Care, Inc.: *See*—
Balbierz, Daniel J., 4,840,613, Cl. 604-51.000.
Hardy, Dwayne E., 4,840,622, Cl. 604-264.000.
Mennen Company, The: *See*—
Fattori, Joseph E.; and Wagner, Siegbert O., 4,840,511, Cl. 401-213.000.
Mentzer, Mark A.: *See*—
Lampe, Donald R.; Mentzer, Mark A.; and Naviasky, Eric H., 4,841,480, Cl. 365-87.000.
Merck & Co., Inc.: *See*—
Lee, Ta J.; and Hoffman, William F., 4,841,074, Cl. 549-292.000.
Shepard, Kenneth L.; and Graham, Samuel L., 4,840,963, Cl. 514-418.000.
Merlin, Dennis, to Hillwell Manufacturing Inc. Container dispensing system. 4,840,291, Cl. 221-59.000.
Merrill, David E.: *See*—
Brookman, Donald L.; Merrill, David E.; and Grollimund, Everett C., 4,840,694, Cl. 156-344.000.
Merritt, Carleton G.: *See*—
Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., 4,840,808, Cl. 426-270.000.
Mersing, Roger L., to Odetics, Inc. Method of forming a magnetic head. 4,839,959, Cl. 29-603.000.
Merte, John H.: *See*—
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.
Mesenich, Gerhard: *See*—
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.
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Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.
Metafuse Limited: *See*—
Joseph, Ady, 4,840,711, Cl. 204-15.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Grunewald, Gerhard; and Kriebel, Manfred, 4,840,648, Cl. 55-44.000.
Methe, David E.: *See*—
Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., 4,840,066, Cl. 73-597.000.
Metzger, Karl G.: *See*—
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,841,059, Cl. 546-312.000.
Meumann, Henry R.; and Stark, Johannes, to Foseco International Limited. Insulating linings for furnaces and kilns. 4,840,131, Cl. 110-336.000.
Meyer, Gerard B.: *See*—
Orr, Thomas V.; and Meyer, Gerard B., 4,840,789, Cl. 424-66.000.
Meyer, Hans U. Capacitive sensor for measuring a displacement. 4,841,225, Cl. 324-61.00R.
Meyer, Richard S.; Root, Jeffrey M.; Campbell, Michael L.; and Winter, Daryl B., to Curtice-Burns, Inc. Low caloric alkyl glycoside fatty acid polyester fat substitutes. 4,840,815, Cl. 426-611.000.
Michael, Wolfgang; and Kaletka, Martin, to L. Schuler GmbH. Drawing apparatus in a press. 4,840,055, Cl. 72-345.000.
Michel, Royer, to S.A.T. (Societe Anonyme de Telecommunications). HGCDTE Photodiode with high speed response. 4,841,351, Cl. 357-30.000.
Michels, Roger: *See*—
Reilly, Bernard J.; and Michels, Roger, 4,840,556, Cl. 425-543.000.
Michigan Bell Telephone Company: *See*—
Marson, Albert U., 4,840,582, Cl. 439-491.000.
Micro-Mega: *See*—
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Micronic Interface Technologies: *See*—
James, Wesley, 4,841,515, Cl. 369-100.000.
Middlin, Bruce; Locke, Norman; and Kennedy, Alan W., to M.I.M. Technology Marketing Limited. Method of stripping electrolytically deposited copper from a cathode. 4,840,710, Cl. 204-12.000.
Midwest Power Corporation: *See*—
Jonelis, John A.; and Bata, John I., 4,840,649, Cl. 55-140.000.
Mihara, Toshihiro: *See*—
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 4,841,535, Cl. 372-46.000.
Mihayashi, Keiji: *See*—
Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, 4,840,877, Cl. 430-350.000.
Mikami, Katsumasa: *See*—
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Mikata, Yoshitaka: *See*—
Toyoda, Yoshiharu; Mikata, Yoshitaka; and Yamano, Shoji, 4,840,240, Cl. 177-25.180.
Miles Laboratories, Inc.: *See*—
Sterzel, R. Bernd; and Scriabine, Alexander, 4,840,960, Cl. 514-356.000.
Van Beveren, Shirley M.; and Pappenhagen, Albert R., 4,841,026, Cl. 530-394.000.
Miljanic, Petar N.; and Moore, William J. M., to Canadian Patents and Development Limited-Societe Canadienne Des Brevets Et D'Exploitation Limitee. Current ratio device. 4,841,236, Cl. 324-127.000.
Miller, Alex S.: *See*—
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.
Miller Brewing Company: *See*—
Lindberg, Chris E.; Kot, Edward J.; and Chicoye, Etzer, 4,840,802, Cl. 426-16.000.
Miller, Bruce E.; and Owen, Robert E., to Bipolar Integrated Technology, Inc. High-speed digital multiplier architecture. 4,841,468, Cl. 364-754.000.
Miller, David L.: *See*—
Leufert, Walter P.; and Miller, David L., 4,840,581, Cl. 439-472.000.
Miller, Robert A.; and Stone, Albert L., to Baxter Healthcare Corporation. Method for filling collapsible containers. 4,840,017, Cl. 53-468.000.
Miller, Steven S., to United States of America, Energy. Method of inducing surface ensembles on a metal catalyst. 4,840,931, Cl. 502-162.000.
Millhollan, Michael S.; and Sung, Chiakang, to National Semiconductor Corporation. Output disable control circuit for ECL programmable array logic device. 4,841,176, Cl. 307-475.000.
Millman, Steven E.: *See*—
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., 4,841,389, Cl. 360-75.000.
Mills, Simon F., to European Atomic Energy Community (Euratom). Multiconnector. 4,840,574, Cl. 439-191.000.
Millward, Barry: *See*—
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., 4,840,656, Cl. 65-85.000.
Mimura, Yoshiki: *See*—
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.
Minagawa, Shigekazu: *See*—
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.
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Minata, Shigeki; and Mori, Toshihiro, to NEC Corporation. Housing structure for decreasing a radio unit's susceptibility to static electricity. 4,840,571, Cl. 439-76.000.
Minato, Ichiro: *See*—
Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, 4,841,008, Cl. 528-45.000.
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, to Hitachi, Ltd. Semiconductor memory device and sense amplifier. 4,841,486, Cl. 365-207.000.
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Williams, Mark T.; Winchester, Clinton S.; and Jolson, Joseph D., 4,840,859, Cl. 429-212.000.
Minebea Co., Ltd.: *See*—
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Ming, Alex L. K., to Unimax Distribution Limited. Wheel for a toy vehicle and a toy vehicle having such a wheel. 4,840,599, Cl. 446-465.000.
Minigrip, Inc.: *See*—
Van Erden, Donald L.; and Ausnit, Steven, 4,840,611, Cl. 493-213.000.

Minker, Emil: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Minnesota Mining and Manufacturing Company: *See—*
Ignasiak, Martin C., 4,841,100, Cl. 174-138.00G.
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.
Ofstead, Ronald F., 4,840,992, Cl. 525-61.000.
Patel, Kalyanji U., 4,841,090, Cl. 558-437.000.

Minolta Camera Kabushiki Kaisha: *See—*
Izuhara, Koichi; Caruso, Jeffrey L.; and Johnson, Theodore C., 4,841,472, Cl. 364-900.000.
Ohmori, Naoto, 4,841,314, Cl. 346-160.000.
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.

Mirafi, Inc.: *See—*
Freese, James S., 4,840,515, Cl. 405-45.000.

Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, to Kansai Paint Co., Ltd. Electrodeposition coating method. 4,840,715, Cl. 204-181.100.

Misic, George J.: *See—*
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., 4,841,248, Cl. 324-318.000.

Mitani, Katsuaki; and Ishinaga, Hideki, to Matsushita Electric Industrial Co., Ltd. X-ray shielded projection lens. 4,840,471, Cl. 350-438.000.

Mitchell, James A.; and Bechdel, John F., to International Business Machines Corporation. Extended floating point operations supporting emulation of source instruction execution. 4,841,476, Cl. 364-900.000.

MiTek Industries, Inc.: *See—*
Lines, Jerry L., 4,840,207, Cl. 144-41.000.

Mitsuba Electric Mfg., Co., Ltd.: *See—*
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, 4,841,182, Cl. 310-68.00D.

Mitsubishi Chemical Industries Limited: *See—*
Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, 4,840,981, Cl. 524-114.000.
Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, 4,841,036, Cl. 534-761.000.
Kato, Yoshiaki; and Hihara, Toshio, 4,841,029, Cl. 534-634.000.
Kondou, Tsutomu, 4,840,804, Cl. 426-103.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Oda, Masatsugu; Sasaki, Naoko; Sakaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Mitsubishi Denki K.K.: *See—*
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.
Itagaki, Hidenobu, 4,841,247, Cl. 324-309.000.
Iwata, Masanari, 4,840,090, Cl. 74-804.000.
Kato, Hisao, 4,841,210, Cl. 318-568.240.
Komurasaki, Satosi, 4,840,158, Cl. 123-419.000.
Koyama, Tsunehiro, 4,841,173, Cl. 307-456.000.
Kumabe, Hisao; and Susaki, Wataru, 4,841,532, Cl. 372-45.000.
Kuno, Kazuo, 4,841,269, Cl. 335-299.000.
Majumdar, Gourab, 4,841,345, Cl. 357-23.400.
Matsumoto, Osamu, 4,840,159, Cl. 123-585.000.
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, 4,841,535, Cl. 372-46.000.
Mizuta, Masaharu, 4,841,477, Cl. 364-900.000.
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.
Suda, Kakutaro, 4,840,920, Cl. 437-69.000.
Suyama, Mitiyo, 4,841,449, Cl. 364-449.000.
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Yamauchi, Satomi, 4,840,135, Cl. 112-277.000.

Mitsubishi Kasei Corporation: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, 4,840,995, Cl. 525-133.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Ohmori, Michio; Okamura, Michiya; and Yui, Hiroshi, 4,841,516, Cl. 369-264.000.

Mitsuhashi, Minoru: *See—*
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.

Mitsui & Co., Ltd.: *See—*
Nakamura, Masanobu, 4,840,053, Cl. 72-58.000.

Mitsui Norin Co., Ltd.: *See—*
Hara, Yukihiko; and Suzuki, Tateo, 4,840,966, Cl. 514-456.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Kashiwa, Norio; Toyota, Akinori; and Kioka, Mamoru, 4,841,003, Cl. 526-125.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Nagai, Yoichiro; and Matsumoto, Hideyuki, 4,841,083, Cl. 556-430.000.

Mitsui Toatsu Chemical, Inc.: *See—*
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.

Mitts, Donna M.: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, 4,840,488, Cl. 356-374.000.

Miura, Hiroki: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Miura, Kazuo: *See—*
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.

Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, to Mitsubishi Chemical Industries Limited. Polarizing film: polymer film base containing substituted anthraquinone dichroic dye. 4,840,640, Cl. 8-506.000.

Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, to Mitsubishi Chemical Industries Limited. Cyclic imido anthraquinone compounds. 4,841,057, Cl. 546-183.000.

Miura, Konoe: *See—*
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Miura, Yoshio: *See—*
Suzuki, Motoyuki; Miura, Yoshio; and Fukushima, Akio, 4,841,511, Cl. 369-50.000.

Miyakoshi, Shinichi: *See—*
Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, 4,840,152, Cl. 123-52.0MV.

Miyama, Kenji: *See—*
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.

Miyamoto, Kazuo: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, 4,840,995, Cl. 525-133.000.

Miyamoto, Masaaki: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, 4,840,995, Cl. 525-133.000.

Miyamoto, Takanori: *See—*
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.

Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, to Fujitsu Limited. Digital data multiple conversion system for converting data having a frequency to data having another frequency by a digital stuffing method. 4,841,524, Cl. 370-112.000.

Miyasaka, Tadashi: *See—*
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.

Miyashita, Masahiko, to Nippon Gosei Kaagaku Kogyo. Cyclohexane-2,5-dione-1,4-ylene-bis (-3-propionic acid) derivatives and process for preparing the same. 4,841,096, Cl. 560-126.000.

Miyata, Souichi: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Miyata, Teruo: *See—*
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.

Miyazaki, Hideki; Onda, Kenichi; and Matsuda, Yasuo, to Hitachi, Ltd. Capacitive voltage lowering circuit with dual outputs. 4,841,427, Cl. 363-62.000.

Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, to Canon Kabushiki Kaisha. Method of and apparatus for forming film. 4,840,821, Cl. 427-430.100.

Miyazaki, Yoshihiro: *See*—
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, 4,841,439, Cl. 364-200.000.

Miyazawa, Keiji: *See*—
Kadoya, Norio; Kawachi, Jun; and Miyazawa, Keiji, 4,841,296, Cl. 340-870.160.

Miyazawa, Toshio: *See*—
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou, 4,841,369, Cl. 358-213.260.

Mizerak, Dennis S., to Babcock & Wilcox Company, The. Snap on fuse cover. 4,841,413, Cl. 361-400.000.

Mizoguchi Manufacturing Company Limited: *See*—
Nakayama, Yasuyuki; and Sada, Tomoya, 4,841,136, Cl. 250-231.00R.

Mizohata, Tadashi: *See*—
Kishino, Takao; and Mizohata, Tadashi, 4,841,194, Cl. 313-496.000.

Mizota, Masahiro: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Mizumoto, Kouji: *See*—
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.

Mizuno, Naohito: *See*—
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Mizusaki, Sigenobu: *See*—
Matsumoto, Takashi; Okada, Takashi; and Mizusaki, Sigenobu, 4,841,055, Cl. 546-261.000.

Mizushima, Yukio: *See*—
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, 4,840,953, Cl. 514-258.000.

Mizuta, Akira, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge assembly system. 4,839,953, Cl. 29-225.000.

Mizuta, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Response/-processing apparatus for external-abnormal-state in data processing system. 4,841,477, Cl. 364-900.000.

Mizutani, Isao; Hijikata, Toshihiko; and Harada, Takashi, to NGK Insulators, Ltd. Ceramic honeycomb structural bodies and method of producing the same. 4,840,827, Cl. 428-116.000.

Mizutani, Masashi: *See*—
Tomizawa, Youzi; and Mizutani, Masashi, 4,841,394, Cl. 360-99.060.

Mobil Oil Corporation: *See*—
Chen, Nai Y.; and McCullen, Sharon B., 4,840,929, Cl. 502-74.000.
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., 4,840,335, Cl. 248-97.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,840,928, Cl. 502-41.000.
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.
Pistner, Timothy W., 4,840,610, Cl. 493-194.000.
Valyocsik, Ernest W., 4,840,780, Cl. 423-329.000.

Mobile Satellite Corporation: *See*—
Anderson, Roy E., 4,841,303, Cl. 342-359.000.

Mochida, Ei: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Mochida Pharmaceutical Co., Ltd.: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Mochizuki, Takeshi; Arimoto, Akira; and Saito, Susumu, to Hitachi Koki Company, Limited; and Hitachi, Ltd. Beam position control device. 4,841,137, Cl. 250-236.000.

Modulite Corporation: *See*—
Weber, Franz K., 4,841,424, Cl. 362-352.000.

Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, to Picanol N.V. Process for clamping, fastening and presentation of weft threads in gripper weaving looms and device used to this end. 4,840,203, Cl. 139-453.000.

Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, to Ausimont S.p.A. Compositions based on fluoroelastomers and on modified olefinic polymers. 4,840,994, Cl. 525-72.000.

Moilanen, John R., to American Standard Inc. Scroll compressor relief valve. 4,840,545, Cl. 417-301.000.

Molex Incorporated: *See*—
Sampson, Stephen A.; Dambach, Philip J.; and Brunker, David L., 4,840,451, Cl. 350-96.200.

Molitor, Robert P., to Spalding & Evenflo Companies, Inc. Softball. 4,840,378, Cl. 273-60.00B.

Moller, Hermann: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Molnar, Karl J.: *See*—
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., 4,841,467, Cl. 364-748.000.

Momata, Kazuhiro: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Monsanto Company: *See*—
Franz, John E., 4,840,659, Cl. 71-86.000.
Mathews III, Marion J.; and Peoples, P. Robert, 4,841,087, Cl. 558-363.000.

Montedison S.p.A.: *See*—
Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., 4,841,095, Cl. 560-115.000.

Montres Rado S.A.: *See*—
Scholpp, Werner, 4,840,044, Cl. 63-4.000.

Mooberry, Jared B.; and Singer, Stephen P., to Eastman Kodak Company. Photographic element and process comprising a dye releasing group. 4,840,884, Cl. 430-557.000.

Moody, Leonardo, to Luc-Co., Inc. Jewelry mounting construction. 4,840,045, Cl. 63-12.000.

Moog Inc.: *See*—
Garnjost, Kenneth D., 4,840,111, Cl. 91-436.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., to International Flavors & Fragrances Inc. Use of Schiff base reaction product of methyl anthranilate and canthoxal in augmenting or enhancing aroma or taste of foodstuff or chewing gum. 4,840,801, Cl. 426-3.000.

Moore Business Forms, Inc.: *See*—
Lombardo, Leo, 4,840,306, Cl. 229-73.000.

Moore, David J., to Allied-Signal Inc. Method for manufacturing electrodes for a spark plug. 4,840,594, Cl. 445-7.000.

Moore, Donald M. Automatic jumper cables. 4,840,583, Cl. 439-504.000.

Moore, Edward R.: *See*—
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., 4,840,791, Cl. 424-71.000.

Moore, William J. M.: *See*—
Miljanic, Petar N.; and Moore, William J. M., 4,841,236, Cl. 324-127.000.

Moravcsik, Imre: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Moreaux, Francois: *See*—
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.

Morgan, Harry C., to Ocutech. Method of molding articles. 4,840,754, Cl. 264-2.200.

Mori, Keiji: *See*—
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, 4,840,326, Cl. 242-199.000.

Mori, Shigeru; and Takahashi, Takayuki, to Shin-Etsu Chemical Co., Ltd. Adhesive grease composition comprising a random copolymer of ethylene and an alpha-olefin. 4,840,739, Cl. 252-17.000.

Mori, Toshihiro: *See*—
Minata, Shigeki; and Mori, Toshihiro, 4,840,571, Cl. 439-76.000.

Morihisa, Toshiharu: *See*—
Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, 4,841,563, Cl. 379-150.000.

Morikawa, Kiyoshi: *See*—
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.

Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Fiber reactive monoazo compounds having two vinylsulfone type fiber reactive groups in the molecule. 4,841,032, Cl. 534-642.000.

Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Reactive red monoazo dye compound having two vinylsulfone type fiber reactive groups. 4,841,033, Cl. 534-642.000.

Morimoto, Isamu: *See*—
Uesawa, Yutaka; and Morimoto, Isamu, 4,840,889, Cl. 430-597.000.

Morimura, Toshiyuki: *See*—
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.

Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Scroll compressor with control of distance between driving and driven scroll axes. 4,840,549, Cl. 418-55.000.

Morita, Toyoo: *See*—
Akiyama, Hideki; and Morita, Toyoo, 4,839,963, Cl. 29-766.000.

Moriwaki, Nobuyuki: *See*—
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.

Moriya, Kaoru: *See*—
Masuko, Takayuki; Suzuki, Norio; and Moriya, Kaoru, 4,839,993, Cl. 51-129.000.

Moriyama, Keiji, to Nikon Corporation. Telephoto zoom lens. 4,840,469, Cl. 350-427.000.

Moroe, Tomomi, to Omron Tateisi Electronics Co. Terminal provided with a printer. 4,840,344, Cl. 248-676.000.

Morrison, Larry R.; and Jenkins, Vaughn J., to Unisys Corporation. High-speed sampling phase detector for clock and data recovery system. 4,841,257, Cl. 331-26.000.

Morton Thiokol, Inc.: *See*—
McDonald, Allan J., 4,840,024, Cl. 60-39.461.

Moser, Helmut A.: *See*—
Auerbach, Gunther; and Moser, Helmut A., 4,840,642, Cl. 8-549.000.

Moss, Thera C.: *See*—
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.

Motai, Tsuneaki: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.

Motorola, Inc.: *See*—
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., 4,841,133, Cl. 235-492.000.

Motozato, Yoshiaki: *See*—
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.

Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, to Compagnie Generale D'Electricite. Multidielectric mirror for carbon dioxide laser providing the mid infrared, in high reflectance with good protection against mechanical attack. 4,840,442, Cl. 350-1.600.

Mowry, Greg S., to Magnetic Peripherals Inc. Non linear magnetoresistive sensor. 4,841,398, Cl. 360-113.000.

MRT System Aktiebolag: *See*—
Kulander, Hans, 4,840,314, Cl. 241-24.000.

MTS Systems Corporation: *See*—
Meline, Harry R.; and Paulsen, Eric L., 4,841,226, Cl. 324-61.00R.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Sikorski, Siegfried, 4,840,536, Cl. 415-190.000.

Mueller, Gottfried, to Siemens Aktiengesellschaft. Housing for long-field lamps having interchangeable louver insert. 4,841,421, Cl. 362-279.000.

Mueller, Jens, to Werner Turck GmbH Co., KG. Proximity switch immune to interference fields. 4,841,163, Cl. 307-116.000.

Mueller, Rudolf; and Strasser, Ludwig, to Bayerische Motoren Werke Aktiengesellschaft. Wheel suspension for steerable rear wheel on motor vehicles equipped with front wheel steering especially passenger vehicle. 4,840,393, Cl. 280-661.000.

Muerdter, Herbert: *See*—
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, 4,841,280, Cl. 340-706.000.

Muhlbauer, Johann: *See*—
Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, 4,841,542, Cl. 373-73.000.

Mukai, Seiichi: *See*—
Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, 4,840,981, Cl. 524-114.000.

Mukaida, Yutaka: *See*—
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.

Mulawka, Jan; Konczykowska, Agnieszka; and Bon, Michel, to Etat Francais represente par le Ministre Delegue des Postes et Telecommunications (CNET); and Mulawka, Jan. Biquad block with switched capacitors without continuous feedback loop and with no sensitivity compared with the gain of operational amplifiers and the ratio of the capacitances. 4,841,263, Cl. 333-173.000.

Mullay, John J.: *See*—
Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., 4,840,687, Cl. 149-2.000.

Muller, Hans-Klaus: *See*—
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.

Muller, John E., Jr., to Pomona Service & Supply Co., Inc. Paper bag feeder for bag-filling operations and process. 4,840,016, Cl. 53-459.000.

Muller, Klaus-Helmut: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Muller, Kurt; and Bohler, Erwin, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for delivering ammunition from a container structure to a firing weapon. 4,840,109, Cl. 89-33.140.

Muller, Kurt: *See*—
Hurlemann, Ernst; Muller, Kurt; and Ruppen, Bruno, 4,840,108, Cl. 89-33.140.

Muller, Walter; and Krouskop, Thomas A., to Clayton Foundation for Research. Calibration controller for controlling electrically operated machines. 4,840,634, Cl. 623-24.000.

Munyon, Gary D.: *See*—
Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., 4,840,120, Cl. 101-228.000.

Murai, Ryukichi, to Yoshida Kogyo K. K. Cord lock. 4,839,946, Cl. 24-115.00G.

Murai, Takaaki; and Sakai, Katsuhisa, to Daicel Chemical Industries, Ltd. Polyether compounds, epoxy resins and processes for production thereof. 4,841,017, Cl. 525-327.300.

Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, to Toyota Jidosha Kabushiki Kaisha. Controlling method for operation of painting booth. 4,840,116, Cl. 98-115.200.

Murakami, Hideto; and Kitamura, Terukiyo, to Nissan Motor Co., Ltd. Disc brake. 4,840,255, Cl. 188-73.350.

Murakami, Hirosi: *See*—
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.

Murakami, Joji; Sibazaki, Syogo; and Tempaku, Junya, to Fujitsu Limited; and Fujitsu Microcomputer Systems Limited. Bit pattern conversion system. 4,841,298, Cl. 341-51.000.

Murakami, Shuichi; and Shimano, Yasunao, to Komatsu Seiren Co., Ltd. Method for treatment of fibrous materials. 4,840,817, Cl. 427-45.100.

Murakami, Teruo; and Seo, Naobumi, to Kabushiki Kaisha Toshiba. Information recording system and reproducing for recording and reproducing information on a magneto-optical disk. 4,841,502, Cl. 369-13.000.

Murakami, Yoichi; and Okawa, Yoshihisa, to NEC Corporation. Servo protection circuit for disk drive. 4,841,384, Cl. 360-60.000.

Muramatsu, Hidenori; Yamada, Kimichika; Nozawa, Katsuya; and Goto, Yoshihiko, to Clarion Co., Ltd. Tape loading apparatus having an arrangement for controlling movement of a guide roller holder arm. 4,841,392, Cl. 360-85.000.

Muramatsu, Mitsuru; and Tominaga, Ryuichiro, to Jujo Paper Co., Ltd. Device for laterally cutting carton case in carton automatic feeding device for a liquid filling machine. 4,840,011, Cl. 53-381.00R.

Murao Boki Kabushiki Kaisha: *See*—
Tadashima, Fumio, 4,840,124, Cl. 104-163.000.

Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, to Bridgestone Corporation. Noise reducing apparatus. 4,840,251, Cl. 181-206.000.

Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, to Sanyo Electric Co., Ltd. Automatic focusing circuit for automatically matching focus in response to video signal. 4,841,370, Cl. 358-227.000.

Murata Manufacturing Co., Ltd.: *See*—
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, 4,841,414, Cl. 361-424.000.
Maeba, Yukio; and Igashira, Kiyoteru, 4,841,425, Cl. 363-21.000.
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.

Murata, Mitsuo: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.

Murata, Mitsuru, to Kabushiki Kaisha Toshiba. Thick-film integrated circuit device capable of being manufactured by means of easy-to-perform trimming operation. 4,841,275, Cl. 338-195.000.

Murayama, Seiichi: *See*—
Kato, Yasuo; Ochiai, Isao; Watanabe, Yoshio; and Murayama, Seiichi, 4,841,556, Cl. 378-119.000.

Murdock, Anthony: *See*—
Ralfs, Colin A.; and Murdock, Anthony, 4,840,070, Cl. 73-818.000.

Muro, Hideo, to Nissan Motor Co., Ltd. Photosensitive position sensor with logarithmic conversion. 4,841,138, Cl. 250-209.000.

Muto, Yoshiyuki: *See*—
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.

Mutt, Viktor: *See*—
Gafvelin, Guro; Carlquist, Mats; and Mutt, Viktor, 4,840,785, Cl. 424-9.000.

Muzslay, Steven Z., to ITT Corporation. Barrier wall connector. 4,840,585, Cl. 439-556.000.

N. V. Bekaert S. A.: *See*—
Bourgois, Luc, 4,840,214, Cl. 152-527.000.

Nabae, Motohiro, to Furukawa Aluminum Co., Ltd. Aluminum alloy for the substrate of magnetic disk. 4,840,685, Cl. 148-439.000.

Nabisco Brands, Inc.: *See*—
Polizzano, Robert A., 4,840,803, Cl. 426-94.000.

Nada, Minoru: *See*—
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.

Nagai, Hideo, to Yokogawa Medical Systems, Limited. Method of and apparatus for carrying out tomography. 4,841,553, Cl. 378-19.000.

Nagai, Yoichiro; and Matsumoto, Hideyuki, to Mitsui Toatsu Chemicals, Incorporated. Ladder polysilanes. 4,841,083, Cl. 556-430.000.

Nagai, Yutaka: *See*—
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, 4,841,535, Cl. 372-46.000.

Nagaike, Sadanori: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.

Nagaki, Kazuyoshi: *See*—
Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, 4,841,022, Cl. 528-487.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed-change operating lever for a bicycle. 4,840,081, Cl. 74-502.200.

Nagano, Masashi, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,840,085, Cl. 74-594.400.

Nagao, Makoto: *See*—
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.

Nagaosa, Hideo: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Nagasaka, Shoji: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.

Nagasawa, Keizo: *See*—
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-32.70E.

Nagasawa, Kenichi: *See*—
Iwasaki, Akio; and Nagasawa, Kenichi, 4,841,391, Cl. 360-85.000.
Nagase, Hiroshi: *See*—
Otsu, Akira; and Nagase, Hiroshi, 4,840,863, Cl. 430-110.000.
Nagata, Eiji: *See*—
Wada, Kenzo; and Nagata, Eiji, 4,841,353, Cl. 357-51.000.
Nagata, Shiro: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.
Nagatomo, Masakatsu: *See*—
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.
Nahara, Akira: *See*—
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.
Naito, Koichi: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Naji, Hooshang: *See*—
Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, 4,841,457, Cl. 364-557.000.
Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, to Otsuka Kagaku Kabushiki Kaisha. Allyl group-containing oligoethyleneoxypolyphosphazenes, process for their preparation, and their use. 4,840,856, Cl. 429-192.000.
Nakae, Kouichi: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Nakagawa, Tatsushi: *See*—
Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, 4,840,849, Cl. 428-419.000.
Nakagawa, Toru; Kubota, Hitoshi; and Sakurai, Yasuo, to Matsushita Electric Industrial Co., Ltd. Method of teaching a path to a moving body. 4,841,430, Cl. 364-167.010.
Nakajima, Kiyoji. Web winding and/or rewinding shaft structure. 4,840,323, Cl. 242-72.00B.
Nakajima, Shunichi; and Izawa, Koji, to Kabushiki Kaisha Toshiba. Image-resolution conversion apparatus for converting a pixel-density of image data. 4,841,375, Cl. 353-280.000.
Nakajima, Toshio: *See*—
Hirabayashi, Shigefumi; and Nakajima, Toshio, 4,840,243, Cl. 180-140.000.
Nakajima, Toshiyuki: *See*—
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.
Nakamura, Atsumi: *See*—
Kaneko, Shoji; and Nakamura, Atsumi, 4,841,558, Cl. 378-182.000.
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Photo semiconductor device having a multi-quantum well structure. 4,840,446, Cl. 350-96.130.
Nakamura, Hitoshi: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.
Nakamura, Ikushi: *See*—
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Nakamura, Kazunari: *See*—
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.
Nakamura, Kensaku. Rotational screw for mixing. 4,840,492, Cl. 366-81.000.
Nakamura, Kikuo: *See*—
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.
Nakamura, Koki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,840,887, Cl. 430-564.000.
Nakamura, Masanobu, to Mitsui & Co., Ltd.; and Kokan Kako Co., Ltd. Method for manufacturing a pipe with projections. 4,840,053, Cl. 72-58.000.
Nakamura, Naoyuki; and Sangen, Masashi, to Matsushita Electronics Corporation. Fluorescent lamp device with incandescent bulb type base cap. 4,841,193, Cl. 313-318.000.
Nakamura, Norihiko: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Nakamura, Shozo; Mathusima, Tokunori; and Tsuji, Kunio, to Hitachi, Ltd. Method of and apparatus for controlling steam vent volume of moisture separator reheaters. 4,840,766, Cl. 376-378.000.
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, to Kabushiki Kaisha Sigma. Bulk loaded coin dispensing machine. 4,840,290, Cl. 221-10.000.
Nakamura, Toshiyuki: *See*—
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.
Nakamura, Tsutomu: *See*—
Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.
Nakamura, Yasunari: *See*—
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, to Tohpren, Co., Ltd. Method for removing impurities from polyphenylene sulfide resin. 4,841,022, Cl. 528-487.000.
Nakanishi, Akira: *See*—
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.
Nakanishi, Kiyoshi: *See*—
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-32.70E.
Nakanishi, Nobuyasu: *See*—
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,840,544, Cl. 417-254.000.
Nakanishi, Yoshiyuki: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.
Nakano, Kenji, to Sony Corporation. Data signal reproducing apparatus. 4,841,385, Cl. 360-65.000.
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, to Mitsubishi Denki Kabushiki Kaisha. Display unit. 4,841,290, Cl. 340-707.000.
Nakano, Masakimi: *See*—
Okada, Tatsuo; Sumiya, Sadao; and Nakano, Masakimi, 4,840,059, Cl. 73-119.00A.
Nakano, Motoo, to Fujitsu Limited. Semiconductor photodetector device with light responsive PN junction gate. 4,841,349, Cl. 357-30.000.
Nakano, Shoichi: *See*—
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Nakano, Tsuyoshi: *See*—
Uchiyama, Hiromi; and Nakano, Tsuyoshi, 4,839,964, Cl. 30-43.600.
Nakata, Tetsuya: *See*—
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, 4,841,081, Cl. 549-541.000.
Nakatani, Kazuo: *See*—
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.
Nakayama, Hiromichi, to Nifco, Inc. Device for fastening bar-like objects. 4,840,333, Cl. 248-68.100.
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, to Ricoh Company, Ltd. Triboelectric charge application member for toner. 4,841,331, Cl. 355-245.000.
Nakayama, Noritaka: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, to Toyo Tire & Rubber Co., Ltd. Rubber composition for tire tread. 4,840,988, Cl. 524-476.000.
Nakayama, Yasuyuki; and Sada, Tomoya, to Mizoguchi Manufacturing Company Limited. Sighting apparatus with automatic correction mechanism. 4,841,136, Cl. 250-231.00R.
Nakazawa, Isao: *See*—
Yamada, Yasuyuki; and Nakazawa, Isao, 4,840,466, Cl. 350-422.000.
Nakazawa, Kogi; and Fujita, Toshihito, to Nitto Boseki Co., Ltd. Method of and apparatus for producing compacted chopped strands. 4,840,755, Cl. 264-15.000.
Nakazyo, Kiyoshi: *See*—
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Nakeuchi, Fumiko: *See*—
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, 4,841,145, Cl. 250-304.000.
Namba, Hideaki: *See*—
Kamei, Eiichi; and Namba, Hideaki, 4,840,245, Cl. 180-179.000.
Nambu, Yoko: *See*—
Endo, Takeshi; Nambu, Yoko; and Yamamoto, Kazutoshi, 4,841,058, Cl. 546-257.000.
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, to Koken Co., Ltd.; and Shiseido Co., Ltd. Surfactant composed of acylated collagen or acylated gelatine and a production process thereof. 4,840,937, Cl. 514-21.000.
Nara, Kenichi; and Takahashi, Ryoichi, to Sanden Corporation. Display cabinet. 4,840,439, Cl. 312-116.000.
Narayanan, G. Hari: *See*—
Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., 4,840,682, Cl. 148-12.70A.
Nartron Corporation: *See*—
Wilhelm, Daniel D., 4,841,198, Cl. 315-82.000.
Naruo, Kyoichi: *See*—
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.

Naruse, Katutoshi: *See*—
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.

Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, to Siemens Aktiengesellschaft. Shock wave source with increased degree of effectiveness. 4,840,166, Cl. 128-24.00A.

Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., to United States of America, Air Force. Band clamp apparatus. 4,840,026, Cl. 60-271.000.

Nass, Ludvig. Pump for liquids and gases. 4,840,546, Cl. 417-403.000.

Nassler, Peter: *See*—
Birkholz, Ulrich; Haertl, Christof; and Nassler, Peter, 4,840,249, Cl. 181-129.000.

Nasu, Katsuaki: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Nathans, Gene R.; and Rosenstein, Robert W., to Becton Dickinson and Company. Purification of antibodies. 4,841,024, Cl. 530-387.000.

National Distillers and Chemical Corporation: *See*—
Wasileski, John M., 4,840,900, Cl. 435-96.000.

National Research Development Corporation: *See*—
Cobbold, Stephen P.; and Waldmann, Herman, 4,841,025, Cl. 530-387.000.
Hider, Robert C.; Kontoghiorghes, George; and Silver, Jack, 4,840,958, Cl. 514-348.000.

National Semiconductor Corporation: *See*—
Millhollan, Michael S.; and Sung, Chiakang, 4,841,176, Cl. 307-475.000.

Naviasky, Eric H.: *See*—
Lampe, Donald R.; Mentzer, Mark A.; and Naviasky, Eric H., 4,841,480, Cl. 365-87.000.

NCR Corporation: *See*—
Grey, Michael O., 4,840,502, Cl. 400-196.000.
Heys, George, Jr.; Yandora, Andrew E.; and McDowell, Philip D., 4,841,412, Cl. 361-393.000.
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., 4,841,343, Cl. 355-77.000.
Yon, Steven A.; and Diaz, Luis A., 4,841,160, Cl. 307-66.000.

NDT Instruments, Inc.: *See*—
Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., 4,840,066, Cl. 73-597.000.

NEC Corporation: *See*—
Aso, Akira, 4,841,352, Cl. 357-45.000.
Demura, Shigeki; and Oura, Toshio, 4,841,487, Cl. 365-230.010.
Ichihara, Masaki, 4,841,301, Cl. 341-126.000.
Kage, Kouzou, 4,841,571, Cl. 380-31.000.
Kimura, Yasuo, 4,841,508, Cl. 361-45.000.
Kinbara, Kouji, 4,840,924, Cl. 437-189.000.
Matsumoto, Takashi, 4,840,921, Cl. 437-89.000.
Minata, Shigeki; and Mori, Toshihiro, 4,840,571, Cl. 439-76.000.
Murakami, Yoichi; and Okawa, Yoshihisa, 4,841,384, Cl. 360-60.000.
Nishio, Makoto, 4,841,519, Cl. 370-3.000.
Saegusa, Noboru, 4,841,167, Cl. 307-269.000.
Sanada, Kohji, 4,841,488, Cl. 365-233.000.
Sugiyama, Takahiro; and Sugawara, Mitsutoshi, 4,841,177, Cl. 307-494.000.
Tamai, Hideki, 4,840,845, Cl. 428-336.000.
Wada, Kenzo; and Nagata, Eiji, 4,841,353, Cl. 357-51.000.
Watanabe, Takaya; and Fushimi, Shigeo, 4,841,265, Cl. 333-194.000.
Yonezu, Kazuya; and Matsumoto, Keiji, 4,841,440, Cl. 364-200.000.

NEC Home Electronics Ltd.: *See*—
Katagiri, Toshiyuki; and Marukado, Kazuhisa, 4,841,366, Cl. 358-167.000.

Neefe, Charles W., to Sunsoft Corp. Dyed color change contact lens. 4,840,477, Cl. 351-162.000.

Neil, Gary A.; and Ferguson, Edward H. F., to TRW United-Carr Ltd. Clips with overlapping engagement members. 4,840,345, Cl. 248-74.200.

Nejigaki, Tatuo; and Kakutani, Yoshimi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for sterilizing a filtration device. 4,840,769, Cl. 422-26.000.

Neko, Noriaki, to Fanuc Ltd. Metering method of injection molding machine. 4,841,211, Cl. 318-569.000.

Nelson, Joyce K.: *See*—
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.

Nerger, Uwe: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Nerheim, Eldon, to Honeywell Inc. Integrated silicon plasma switch. 4,840,122, Cl. 102-202.500.

Nervina, Eugene E. Air conditioner wall sleeve. 4,840,041, Cl. 62-263.000.

Nestec S.A.: *See*—
Hsu, Sheng H., 4,840,809, Cl. 426-285.000.

Neustadt, Bernard R.: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Neuwirth, Helmuth: *See*—
De Luca, Paul V.; and Neuwirth, Helmuth, 4,840,572, Cl. 439-92.000.

Neuwirth, Manfred: *See*—
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, 4,840,736, Cl. 210-727.000.

New York Blood Center, Inc.: *See*—
Horowitz, Bernard, 4,841,023, Cl. 530-351.000.

NGK Insulators, Ltd.: *See*—
Matsuzawa, Soichiro, 4,841,400, Cl. 360-125.000.
Mizutani, Isao; Hijikata, Toshihiko; and Harada, Takashi, 4,840,827, Cl. 428-116.000.

NGK Spark Plug Co., Ltd.: *See*—
Banno, Hisao, 4,841,494, Cl. 367-157.000.
Iio, Satoshi; and Okuno, Akiyasu, 4,840,853, Cl. 428-698.000.
Kojima, Takao; and Yamada, Tetsusyo, 4,840,854, Cl. 428-698.000.

Nguyen, Loc H. Transfer apparatus for semiconductor wafers. 4,840,530, Cl. 414-404.000.

Nice-Pak Products, Inc.: *See*—
Caputo, Garry L.; Saldarelli, Thomas A.; and Dwan, William E., 4,840,270, Cl. 206-205.000.

Nickol, Robert G.: *See*—
Just, Ernst K.; and Nickol, Robert G., 4,841,040, Cl. 536-105.000.

Niemann, Edwin H.: *See*—
Arch, Paul E.; and Niemann, Edwin H., 4,840,759, Cl. 264-53.000.

Nieng, Kenneth Y.: *See*—
Hakim, Shafik J.; Locher, Mark R.; Nieng, Kenneth Y.; and Vagnozzi, Barbara A., 4,841,433, Cl. 364-200.000.

Niereacher, David; and Yip, Douglas, to Data I/O Corporation. Zero insertion force socket for surface-mounted integrated circuits. 4,840,576, Cl. 439-331.000.

Nifco, Inc.: *See*—
Kikuchi, Akio, 4,840,334, Cl. 248-73.000.
Kimisawa, Toshihide, 4,840,001, Cl. 52-208.000.
Kurihara, Kazumasa, 4,840,522, Cl. 411-44.000.
Nakayama, Hiromichi, 4,840,333, Cl. 248-68.100.
Oshida, Tsutomu, 4,840,523, Cl. 411-48.000.

Nihei, Mitsuo: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Nihon Bunko Kogyo Kabushiki Kaisha: *See*—
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, 4,841,145, Cl. 250-304.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-111.810.

Niitsuma, Teruo: *See*—
Okamoto, Takeshi; Niitsuma, Teruo; and Minagawa, Shoichi, 4,841,470, Cl. 364-821.000.

Nijhawan, Subash-Chander; Daniel, Horst; and Dennstedt, Welf, to Varta Batterie Aktiengesellschaft. Galvanic primary element with negative lithium electrode. 4,840,857, Cl. 429-197.000.

Nikken Chemicals Company, Limited: *See*—
Kondou, Tsutomu, 4,840,804, Cl. 426-103.000.

Nikon Corporation: *See*—
Hoshino, Kunihisa, deceased; Hamanishi, Yoshinari; and Utagawa, Ken, 4,841,325, Cl. 354-402.000.
Moriyama, Keiji, 4,840,469, Cl. 350-327.000.
Ogasawara, Akira, 4,841,324, Cl. 354-402.000.

Nilsson, Ingmar, to TX Controls AB. Push-pull control, e.g., a hand throttle or stop control for internal combustion engines. 4,840,079, Cl. 74-500.500.

Ninomiya, Hidetaka: *See*—
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, 4,840,883, Cl. 430-553.000.

Nippon Cable System, Inc.: *See*—
Kobayashi, Tetuo; and Hirai, Shoichi, 4,840,080, Cl. 74-501.50R.

Nippon Gosei Kaagaku Kogyo: *See*—
Miyashita, Masahiko, 4,841,096, Cl. 560-126.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ototake, Satoshi; Matsunaga, Ryozo; and Furusawa, Masao, 4,841,034, Cl. 534-701.000.
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, 4,841,051, Cl. 544-287.000.

Nippon Seiko Co., Ltd.: *See*—
Katahira, Masayuki, 4,840,077, Cl. 74-424.8NA.

Nippon Seiko Kabushiki Kaisha: *See*—
Aida, Akira; and Ikeda, Toshihiro, 4,840,153, Cl. 123-90.550.
Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, 4,841,408, Cl. 361-220.000.
Yamamoto, Kazuo; Ono, Katsuyasu; and Yamamuro, Shinichi, 4,840,402, Cl. 280-804.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Hino, Youichi; Shimasaki, Yuuji; and Ueshima, Michio, 4,841,060, Cl. 546-184.000.
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.

Nippon Soken, Inc.: *See*—
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Nippon Steel Corporation: *See*—
Kimura, Akira; Kashiwabara, Hiroshi; and Fujiyama, Hirohisa, 4,841,116, Cl. 219-73.100.
Nippon Unicar Kabushiki Kaisha: *See*—
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.
Nippondenso Co., Ltd.: *See*—
Kamei, Eiichi; and Namba, Hideaki, 4,840,245, Cl. 180-179.000.
Okada, Tatsuo; Sumiya, Sadao; and Nakano, Masakimi, 4,840,059, Cl. 73-119.00A.
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, 4,840,926, Cl. 501-134.000.
Sakane, Takaaki; and Takeuchi, Kazuhiro, 4,840,541, Cl. 416-223.00R.
Ushida, Masahiko; and Shibata, Hitoshi, 4,841,155, Cl. 250-463.100.
Nisato, Dino: *See*—
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, to Nippon Soken, Inc. Semiconductor pressure sensor with method diaphragm. 4,840,067, Cl. 73-726.000.
Nishiguchi, Yasuo: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Nishihara Engineering Company, Ltd.: *See*—
Watanabe, Takashi, 4,839,927, Cl. 4-211.000.
Nishijima, Toshihisa: *See*—
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, to Hitachi, Ltd. Method for restarting execution interrupted due to page fault in a data processing system. 4,841,439, Cl. 364-200.000.
Nishikawa, Hiroaki: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Nishikawa, Yasuo: *See*—
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.
Nishiki, Hiroyuki; and Kokuryu, Yuji, to Toyoda Gosei Co., Ltd. Hose intermediate retainer. 4,840,408, Cl. 285-62.000.
Nishimoto, Naomichi; Okauchi, Takeshi; and Kido, Koichi, to Victor Company of Japan, Ltd. Control pulse recording circuit for magnetic recording and reproducing apparatus. 4,841,383, Cl. 360-33.100.
Nishimura, Kotaro: *See*—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.
Nishimura, Takashi: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Nishimura, Yukuo: *See*—
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.
Nishio, Koji: *See*—
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, 4,840,858, Cl. 429-197.000.
Nishio, Makoto, to NEC Corporation. Apparatus for discriminating an optical signal from others and an apparatus for tuning an optical wavelength filter used in the same. 4,841,519, Cl. 370-3.000.
Nishiyama, Mikio; Yoshino, Tatsuo; and Akimoto, Taizo, to Fuji Photo Film Co., Ltd. Apparatus for recording CRT image. 4,841,371, Cl. 358-244.000.
Nishizawa, Jun-ichi. Static induction photothyristor having a non-homogeneously doped gate. 4,841,350, Cl. 357-30.000.
Nishizawa, Seiji: *See*—
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, 4,841,145, Cl. 250-304.000.
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou. Solid state imaging device with an arrangement for providing a high speed scan or omitting scanning in an unnecessary pick-up range. 4,841,369, Cl. 358-213.260.
Nissan Chemical Industries, Ltd.: *See*—
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.
Nissan Motor Company Ltd.: *See*—
Aoki, Hiroyuki; Yahagi, Shinichiro; and Saito, Takanobu, 4,840,073, Cl. 73-862.360.
Kawabe, Taketoshi; and Ito, Ken, 4,840,389, Cl. 280-91.000.
Murakami, Hideto; and Kitamura, Terukiyo, 4,840,255, Cl. 188-73.350.
Muro, Hideo, 4,841,138, Cl. 250-209.000.
Oshidari, Toshikazu; Hattori, Noboru; and Kato, Yoshiaki, 4,840,261, Cl. 192-106.00F.
Nissin Kogyo Kabushiki Kaisha: *See*—
Terashima, Hideyuki; and Tsuchiya, Yasuhiko, 4,840,082, Cl. 74-523.000.
Nitschke, Wieland: *See*—
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.
Nitta, Toyohiko: *See*—
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.
Nittetsu Kougyo Kabushiki Kaisha: *See*—
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.
Nitto Boseki Co., Ltd.: *See*—
Nakazawa, Kogi; and Fujita, Toshihito, 4,840,755, Cl. 264-15.000.
Niwa, Hideo: *See*—
Izumi, Akira; Kishi, Tomomi; and Niwa, Hideo, 4,840,417, Cl. 294-65.500.
Niwa, Yukichi: *See*—
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., to Adata Software Limited. Method of creating a computer system. 4,841,441, Cl. 364-401.000.
Noack, Georg: *See*—
Federmann, Helmut; Levacher, Friedrich K.; and Noack, Georg, 4,840,452, Cl. 350-96.230.
Noake, Kaneo, to Chisso Corporation. Process for producing a silicon carbide. 4,840,781, Cl. 423-345.000.
Noble, Roger H., to Tush Cush, Inc. Varying support cushioned seating assembly and method. 4,840,425, Cl. 297-284.000.
Noda, Kazuo: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.
Noda, Sakuo: *See*—
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.
Nogami, Kouji: *See*—
Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, 4,841,278, Cl. 340-908.100.
Noguchi, Hiroshi: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Noguchi, Hitoshi; and Wakamatsu, Hideki, to Hewlett-Packard Company. Apparatus for indicating the resistive characteristic of a capacitor. 4,841,228, Cl. 324-62.000.
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, to Hitachi, Ltd. Measuring apparatus for etching pits. 4,840,487, Cl. 356-355.000.
Noguchi, Noboru: *See*—
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,840,544, Cl. 417-254.000.
Noguchi, Satoshi: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.
Noguchi, Tatsuo, to Kabushiki Kaisha Toshiba. Field-effect transistor devices. 4,841,346, Cl. 357-23.100.
Noirot, Frederic: *See*—
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, 4,841,106, Cl. 200-462.000.
Nojiri, Yasutami: *See*—
Chikamasa, Hiroshi; Utsui, Masaaki; and Nojiri, Yasutami, 4,840,818, Cl. 427-130.000.
Noll, Tobias: *See*—
Kuenemund, Ronald; and Noll, Tobias, 4,841,469, Cl. 364-754.000.
Nomaki, Tatsuo: *See*—
Shigemitsu, Fumiaki; Usuda, Kinya; and Nomaki, Tatsuo, 4,840,874, Cl. 430-296.000.
Nomiyama, Mayumi: *See*—
Yamagishi, Hideaki; and Nomiyama, Mayumi, 4,841,272, Cl. 338-2.000.
Nomura, Jun: *See*—
Ihara, Keisuke; Alaki, Yasuhide; and Nomura, Jun, 4,840,381, Cl. 273-232.000.
Nomura, Kenichi: *See*—
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Nonaka, Nobuyuki: *See*—
Oda, Masatsugu; Sasaki, Naoko; Sakaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.
Nonaka, Yuji: *See*—
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.
Nordisk Kartro AB: *See*—
Sjogren, Borje, 4,840,054, Cl. 72-382.000.
Norkoski, Joseph: *See*—
Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., 4,840,008, Cl. 53-137.000.

Noro, Shuhei: *See—*
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.

North American Philips Consumer Electronics Corp.: *See—*
Stierberger, Willy F., 4,841,406, Cl. 361-91.000.

North American Philips Corp.: *See—*
Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, 4,841,243, Cl. 324-174.000.
Rumbolt, Robin B.; Guerinot, William F.; and Dargis, Daniel J., 4,841,368, Cl. 358-194.100.
Russell, Robert H., 4,841,492, Cl. 367-105.000.

North Carolina State University: *See—*
Cuculo, John A.; Theil, Michael H.; Yang, Kap S.; and Chen, Yue S., 4,840,673, Cl. 106-198.000.

Northern Telecom Limited: *See—*
Bisson, Joel, 4,841,178, Cl. 307-518.000.

Nose, Masahiko: *See—*
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, 4,840,296, Cl. 222-600.000.

Nose, Noriyuki: *See—*
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.

Notz, Wolfgang; Schwarz, Volker; and Augustin, Ulrich, to Daimler-Benz Aktiengesellschaft. Arrangement for the determination of the injection progress in an internal combustion engine. 4,840,060, Cl. 73-119.00A.

Novak, Frank; and Fleiss, Hartmut W., to Welding Services, Inc. Automatic welding device. 4,841,123, Cl. 219-125.120.

Novy, Donald A. Acoustic impedance inducing device. 4,840,250, Cl. 181-175.000.

Nowark, Charles G., Jr.: *See—*
MacLeod, Donald J.; Peterson, Miles L.; and Nowark, Charles G., Jr., 4,841,393, Cl. 360-98.070.

Nozaki, Satoshi: *See—*
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.

Nozawa, Katsuya: *See—*
Muramatsu, Hidenori; Yamada, Kimichika; Nozawa, Katsuya; and Goto, Yoshihiko, 4,841,392, Cl. 360-85.000.

Nozu, Shinsaku; Kase, Masao; and Yamashita, Masakazu, to Pioneer Electronic Corporation. Clamping mechanism for information recording disk. 4,841,518, Cl. 369-270.000.

NTN Toyo Bearing Co., Ltd.: *See—*
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-32.70E.

Nupro Company: *See—*
Gausman, Theodore J.; and Scheffel, Gary W., 4,840,191, Cl. 137-15.000.

Nusbaum, David B.; and Mayfield, Robert L., to Deere & Company. Master safety shield with deflecting door. 4,840,604, Cl. 464-176.000.

Nussbaumer, Walter; and Beyrer, Karl-Heinz, to Maschinenfabrik Ravensburg AG. Turning machine. 4,840,095, Cl. 82-117.000.

Nuytkens, Peter, to Charles Stark Draper Laboratory, Inc., The. Digital direct sequence spread spectrum receiver. 4,841,544, Cl. 375-1.000.

N.V. Bekaert S.A.: *See—*
Chambaere, Daniel, 4,841,119, Cl. 219-146.100.

Nyfeler, Robert: *See—*
Zondler, Helmut; Hubele, Adolf; and Nyfeler, Robert, 4,840,662, Cl. 71-92.000.

O & K Orenstein & Koppel AG: *See—*
Althoff, Karl-Heinz, 4,840,533, Cl. 414-495.000.

Obata, Isao: *See—*
Yamada, Jiro; Haseoka, Masahide; and Obata, Isao, 4,841,503, Cl. 369-14.000.

Obenauf, Dieter: *See—*
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.

Oberlinner, Andreas: *See—*
Guentner, Andreas; Mayer, Udo; and Oberlinner, Andreas, 4,841,050, Cl. 544-150.000.

O'Brien, James A., II. Security hinge with improved structural integrity with the electrical wires located along the pivot axis of the knuckles. 4,839,939, Cl. 16-223.000.

Ochenski, James E.: *See—*
Plutschuck, Lawrence; and Ochenski, James E., 4,840,518, Cl. 407-113.000.

Ochiai, Isao: *See—*
Kato, Yasuo; Ochiai, Isao; Watanabe, Yoshio; and Murayama, Seiichi, 4,841,556, Cl. 378-119.000.

O'Connor, Chadwell. Locking tripod leg. 4,840,338, Cl. 248-168.000.

Ocutech: *See—*
Morgan, Harry C., 4,840,754, Cl. 264-2.200.

Ocvirk, Norbert: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.

Oda, Masatsugu; Sasaki, Naoko; Sakaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, to Mitsubishi Chemical Industries Limited. Pyridinecarboxamide derivatives and their use as fungicide. 4,840,959, Cl. 514-355.000.

Oda, Osamu: *See—*
Ichikawa, Norihito; Someya, Ikeo; Oda, Osamu; and Amano, Toshio, 4,841,367, Cl. 358-181.000.

Oda, Yoshiaki: *See—*
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.

Odenwalder, Heinrich: *See—*
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.

Odetics, Inc.: *See—*
Mersing, Roger L., 4,839,959, Cl. 29-603.000.

Oestreich, Ulrich; and Giebel, Wolfgang, to Siemens Aktiengesellschaft. Arrangement for the connection of an intermediate repeater for submarine cables. 4,841,103, Cl. 174-70.00S.

Oestreich, Ulrich: *See—*
Goetze, Werner; Mayr, Ernst; Oestreich, Ulrich; and Saller, Helmut, 4,839,970, Cl. 350-96.230.

Oestreicher, Stephen L.: *See—*
Kowite, William J.; and Oestreicher, Stephen L., 4,840,660, Cl. 71-86.000.

Office National d'Etudes et de Recherches Aerospatiales (ONERA): *See—*
Richard, Philippe; Soulage, Andre ; and Appel, Jean, 4,841,304, Cl. 342-460.000.

Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Copolymers of poly(vinyl trifluoroacetate) or poly(vinyl alcohol). 4,840,992, Cl. 525-61.000.

Ogasawara, Akira, to Nikon Corporation. Camera having an autofocusing device. 4,841,324, Cl. 354-402.000.

Ogasawara, Fumihiro: *See—*
Asami, Kazuo; and Ogasawara, Fumihiro, 4,841,373, Cl. 358-257.000.

Ogasawara, Toshio: *See—*
Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, 4,840,715, Cl. 204-181.100.

Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, to Matsushita Electric Industrial Co., Ltd. Integrator for an exposure apparatus or the like. 4,841,341, Cl. 355-43.000.

Ogawa, Kazufumi: *See—*
Endo, Masayuki; Sasago, Masaru; and Ogawa, Kazufumi, 4,840,872, Cl. 430-273.000.

Ogawa, Toshio: *See—*
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.

Ogawara, Hiroshi: *See—*
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, 4,841,077, Cl. 549-402.000.

Ogden, John E.: *See—*
Larkin, Mark E.; and Ogden, John E., 4,840,621, Cl. 604-29.000.

Ogi, Keiji: *See—*
Kamitakahara, Atushi; and Ogi, Keiji, 4,840,879, Cl. 430-406.000.

Ogihara, Sumio: *See—*
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.

Oglesby, Gary; and Andrus, Bryan, to Bally Manufacturing Corporation. Diagnostic testing system for an exercie machine. 4,840,372, Cl. 272-72.000.

Ogura, Tadashi: *See—*
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.

Oguri, Yukio: *See—*
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.

Ohashi, Masashi: *See—*
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.

Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, to Eisai Co., Ltd. Aqueous solution containing lipid-soluble pharmaceutical substance. 4,840,970, Cl. 514-690.000.

Ohba, Hisao: *See—*
Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, 4,841,320, Cl. 354-299.000.

Ohba, Motoi; and Makimoto, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Frequency synthesizer. 4,841,255, Cl. 331-14.000.

Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, to Hitachi, Ltd. Semiconductor laser devices. 4,841,536, Cl. 372-46.000.

Ohishi, Akio: *See—*
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.

Ohishi, Kazutami, to Koito Seisakusho Co., Ltd. Lamp assembly having a snap-on connector for ready mounting and dismounting of a light bulb to and from a lamp housing. 4,841,419, Cl. 362-226.000.

Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material containing a yellow DIR coupler. 4,840,880, Cl. 430-505.000.

Ohlschlager, Hans; Schranz, Karl-Wilhelm; and Sobel, Johannes, to Agfa-Gevaert Aktiengesellschaft. Hardened proteinic binder layer. 4,840,890, Cl. 430-622.000.
Ohlschlager, Hans: *See*—
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, to Sumitomo Chemical Company, Limited. Conjugate fibers and nonwoven molding thereof. 4,840,847, Cl. 428-373.000.
Ohmori, Koji: *See*—
Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.
Ohmori, Michio; Okamura, Michiya; and Yui, Hiroshi, to Mitsubishi Petrochemical Co., Ltd. Turntable for mounting recording medium in disk form. 4,841,516, Cl. 369-264.000.
Ohmori, Naoto, to Minolta Camera Kabushiki Kaisha. Electrostatic latent image forming apparatus using semiconductor laser. 4,841,314, Cl. 346-160.000.
Ohnemuller, Hans-Joachim: *See*—
Leiber, Heinz; and Ohnemuller, Hans-Joachim, 4,841,446, Cl. 364-426.020.
Ohnemus, Fritz: *See*—
Hartmann, Uwe; and Ohnemus, Fritz, 4,841,251, Cl. 328-36.000.
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, to Mochida Pharmaceutical Co., Ltd. Cephalosporin derivatives. 4,840,945, Cl. 514-206.000.
Ohnishi, Tsuyoshi. Preparation and uses of new prostaglandin derivatives which protect cell membranes against ischemic, physical, chemical, and biological injuries. 4,840,968, Cl. 514-530.000.
Ohno, Kuniharu: *See*—
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.
Ohno, Kunio, to Olympus Optical Co., Ltd. Treating instrument for use with an endoscope. 4,840,176, Cl. 128-303.140.
Ohno, Nobuo: *See*—
Kakisawa, Hiroshi; Kusumi, Takenori; and Ohno, Nobuo, 4,840,658, Cl. 71-67.000.
Ohnuki, Tohru: *See*—
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, to Bayer Aktiengesellschaft. Copolymer made from n-vinylamides and perfluoroalkyl group-containing, ethylenically unsaturated compounds, a process for their preparation, and their use. 4,840,989, Cl. 524-544.000.
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, to Canon Kabushiki Kaisha; and Mitsubishi Chemical Industries Limited. Amino sulfonaphtholtrisazo compounds and recording liquids containing the same. 4,841,037, Cl. 534-815.000.
Ohtaka, Keiji: *See*—
Koyama, Takeshi; and Ohtaka, Keiji, 4,841,326, Cl. 354-406.000.
Ohtake, Yoshichi, to Victor Company of Japan, Ltd. Drive control of zoom lens in zooming system. 4,840,470, Cl. 350-429.000.
Ohtani, Sumio: *See*—
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.
Ohura, Masaki: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Ohya, Hiroko: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Ohya, Koichi: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,841,461, Cl. 364-572.000.
Ohya, Nobuyuki: *See*—
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, 4,840,926, Cl. 501-134.000.
Oikawa, Ryuetsu; and Fujita, Akihiko, to Yazaki Corporation. Grommet structure. 4,839,937, Cl. 16-2.000.
Oishi, Kengo, to Fuji Photo Film Co., Ltd. Manufacturing method for magnetic tape cassette. 4,840,760, Cl. 264-245.000.
Oishi, Kengo: *See*—
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, to Hitachi, Ltd. Atomic absorption spectrophotometer with furnace at pressure equal or near light source pressure. 4,840,484, Cl. 356-312.000.
Oji-National Co., Ltd.: *See*—
Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, 4,840,875, Cl. 430-309.000.
Oji Paper Co., Ltd.: *See*—
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.
Oka, Akinori: *See*—
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.
Oka, Ken K., to Deere & Company. Mower height adjustment mechanism. 4,840,020, Cl. 56-15.200.
Okabe, Masato: *See*—
Ishikawa, Tetsushi; Okabe, Masato; and Kato, Hiroyasu, 4,840,142, Cl. 119-17.000.
Okada, Sensuke: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.
Okada, Takashi: *See*—
Matsumoto, Takashi; Okada, Takashi; and Mizusaki, Sigenobu, 4,841,055, Cl. 546-261.000.
Okada, Tatsuo; Sumiya, Sadao; and Nakano, Masakimi, to Nippondenso Co., Ltd. Method for adjusting fuel injection quantity of electromagnetic fuel injector. 4,840,059, Cl. 73-119.00A.
Okada, Yoshimi; Kimura, Masao; and Okubo, Kazuo, to Shinko Electric Co., Ltd. Engine start type VSCF generating system. 4,841,216, Cl. 322-10.000.
Okamoto, Hidefumi: *See*—
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,840,805, Cl. 426-129.000.
Okamoto, Nobuyuki: *See*—
Kambayashi, Koji; Okamoto, Nobuyuki; and Kawanami, Kenichiro, 4,841,289, Cl. 340-703.000.
Okamoto, Takeshi; Niitsuma, Teruo; and Minagawa, Shoichi, to Clarion, Co., Ltd. Surface acoustic wave device for differential phase shift keying convolving. 4,841,470, Cl. 364-821.000.
Okamura, Masao: *See*—
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.
Okamura, Michiya: *See*—
Ohmori, Michio; Okamura, Michiya; and Yui, Hiroshi, 4,841,516, Cl. 369-264.000.
Okauchi, Takeshi: *See*—
Nishimoto, Naomichi; Okauchi, Takeshi; and Kido, Koichi, 4,841,383, Cl. 360-33.100.
Okawa, Tadashi: *See*—
Suzuki, Toshio; and Okawa, Tadashi, 4,840,693, Cl. 156-329.000.
Okawa, Yoshihisa: *See*—
Murakami, Yoichi; and Okawa, Yoshihisa, 4,841,384, Cl. 360-60.000.
Oki Electric Industry Co., Ltd.: *See*—
Tomikawa, Arifumi; and Yasukawa, Nihiko, 4,840,258, Cl. 190-102.000.
Okubo, Kazuo: *See*—
Okada, Yoshimi; Kimura, Masao; and Okubo, Kazuo, 4,841,216, Cl. 322-10.000.
Okuda, Naoki: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.
Okuhara, Hisakazu: *See*—
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.
Okumoto, Toyoharu: *See*—
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.
Okumura, Atsuo, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having improved exhaust emission characteristics. 4,840,027, Cl. 60-274.000.
Okumura, Masahide: *See*—
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.
Okumura, Seigo: *See*—
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Okuno, Akiyasu: *See*—
Iio, Satoshi; and Okuno, Akiyasu, 4,840,853, Cl. 428-698.000.
Okuwaki, Toyoji: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Oldani, Diego: *See*—
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.
Olin Corporation: *See*—
Pryor, Michael J., 4,840,654, Cl. 65-18.100.
Olivier, Jacques: *See*—
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.
Olsen, Robert J., to Amoco Corporation. Ammonolysis-alkylation reactions using ammonia and an alcohol to prepare N-alkyl maleimides and N-alkyl succinimides. 4,841,069, Cl. 548-545.000.
Olsson, Sven G.; and Jonson, Bjorn, to Siemens Elema AB. Respirator and a method of utilizing the respirator to promote blood circulation. 4,840,167, Cl. 128-28.000.
Olympus Optical Co., Ltd.: *See*—
Ohno, Kunio, 4,840,176, Cl. 128-303.140.

Takada, Katsuhiro; and Yamanashi, Takanori, 4,840,467, Cl. 350-427.000.
Yoshizawa, Akihiko, 4,841,510, Cl. 369-46.000.
Omi, Toshihiro: *See—*
Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, 4,840,488, Cl. 356-374.000.
Omron Tateisi Electronics Co.: *See—*
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Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.
Omura, Takashi: *See—*
Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, 4,841,027, Cl. 534-599.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,032, Cl. 534-642.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,033, Cl. 534-642.000.
Sawamoto, Hirokazu; Omura, Takashi; and Harada, Naoki, 4,841,048, Cl. 544-74.000.
Onda, Kenichi: *See—*
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Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, to Fujikura Ltd. Apparatus for continuously producing heat-shrinkable crosslinked resin tube. 4,840,552, Cl. 425-72.100.
Onishi, Masanari: *See—*
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, 4,840,104, Cl. 84-437.000.
Onishi, Sei: *See—*
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Onizawa, Yoshio: *See—*
Izuka, Akihiro; Onizawa, Yoshio; and Yamashita, Mitsuru, 4,841,501, Cl. 369-13.000.
Ono, Katsuyasu: *See—*
Yamamoto, Kazuo; Ono, Katsuyasu; and Yamamuro, Shinichi, 4,840,402, Cl. 280-804.000.
Ono, Koji: *See—*
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.
Ono, Kouji: *See—*
Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000.
Ono, Motoyuki: *See—*
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.
Onodera, Akira: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Onoe, Hiroyasu: *See—*
Ueyama, Seiji; and Onoe, Hiroyasu, 4,840,835, Cl. 428-212.000.
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, to Oji Paper Co., Ltd. Electrostatic recording material. 4,840,834, Cl. 428-211.000.
Oppelt, Ralph: *See—*
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000.
Optical Coating Laboratory, Inc.: *See—*
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.
Opticon Inc.: *See—*
Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, 4,841,129, Cl. 235-472.000.
Orain, Roger, to Saint-Gobain Vitrage. Process and apparatus for bending glass plates. 4,840,657, Cl. 65-107.000.
Orii, Akira; and Kongo, Takeshi, to Janome Sewing Machine Co., Ltd. Speed control device for an electronic sewing machine. 4,841,206, Cl. 388-828.000.
Orlando, James A., to Ford Motor Company. Elevating and traversing hood hinge. 4,839,941, Cl. 16-361.000.
Orr, Thomas V.; and Meyer, Gerard B., to Procter & Gamble Company, The. Antiperspirant creams. 4,840,789, Cl. 424-66.000.
Orru, Vittoria: *See—*
Di Schiena, Michele G.; and Orru, Vittoria, 4,840,964, Cl. 514-448.000.
Ortiz, Angel L., Jr.: *See—*
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., 4,840,450, Cl. 350-96.200.
Osada, Mototsugu: *See—*
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, 4,840,296, Cl. 222-600.000.
Osaka Soda Co., Ltd.: *See—*
Kasai, Naoya; Shima, Hisaharu; and Tsujimura, Kazuya, 4,840,907, Cl. 435-253.300.
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, 4,841,081, Cl. 549-541.000.
Osaki, Norio: *See—*
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, 4,840,957, Cl. 514-326.000.
Osaki, Tatsuo, to Yoshida Kogyo K. K. Method of and apparatus for attaching top stops to slide fastener chain. 4,839,956, Cl. 29-408.000.
Oshida, Tsutomu, to Nifco, Inc. Securing device. 4,840,523, Cl. 411-48.000.
Oshidari, Toshikazu; Hattori, Noboru; and Kato, Yoshiaki, to Nissan Motor Co., Ltd. Automatic transmission having centrifugally operable drain valve in hydraulically operated clutch actuator. 4,840,261, Cl. 192-106.00F.
Oshikawa, Michitaka, to Toko Kabushiki Kaisha. Ladder-type ceramic filter. 4,841,264, Cl. 333-189.000.
Osterholm, Jewell L., to Thomas Jefferson University. Cerebral and lumbar perfusion catheterization apparatus for use in treating hypoxic/ischemic neurologic tissue. 4,840,617, Cl. 604-174.000.
Ostertag, Werner, to BASF Aktiengesellschaft. Plateletlike two-phase pigment. 4,840,677, Cl. 106-456.000.
Osthus, Harold L.; de Raismes, John F.; Wolfson, Lawrence S.; and Vaida, Robert M., to Gerber Garment Technology, Inc. Conveyorized apparatus with moveable rail section. 4,840,123, Cl. 104-100.000.
Ota, Motoki: *See—*
Ikeda, Tsunemi; and Ota, Motoki, 4,840,030, Cl. 60-324.000.
Otake, Katsumasa: *See—*
Kayane, Yutaka; Otake, Katsumasa; and Tezuka, Yasuo, 4,841,031, Cl. 534-638.000.
Otis Engineering Corporation: *See—*
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.
Ototake, Satoshi; Matsunaga, Ryozo; and Furusawa, Masao, to Nippon Kayaku Kabushiki Kaisha. Water-soluble azo compounds having a triazine moiety and dyeing method therewith. 4,841,034, Cl. 534-701.000.
Otsu, Akira; and Nagase, Hiroshi, to Fujikura Kasei Co., Ltd. Positively chargeable toner for use in dry electrophotography. 4,840,863, Cl. 430-110.000.
Otsubo, Toru: *See—*
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, 4,840,487, Cl. 356-355.000.
Otsuka Kagaku Kabushiki Kaisha: *See—*
Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, 4,840,856, Cl. 429-192.000.
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, 4,840,957, Cl. 514-326.000.
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, to Shinagawa Refractories Co., Ltd. Clamping and fixing apparatus for a refractory-made plate for a slide gate valve for controlling a molten steel flow. 4,840,296, Cl. 222-600.000.
Ott, Helmut, to Herion-Werke KG. Control valve. 4,840,198, Cl. 137-625.640.
Ouchi, Junichi, to Alps Electric Co., Ltd. Optical coordinates inputting apparatus having switching means to operate y-axis light emitters when operation of the x-axis emitters outputs a coordinates signal. 4,841,141, Cl. 250-221.000.
Oura, Toshio: *See—*
Demura, Shigeki; and Oura, Toshio, 4,841,487, Cl. 365-230.010.
Overbay, Mark A., to Combustion Engineering, Inc. Orbital weld head tool. 4,841,118, Cl. 219-124.030.
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, to Konishiroku Photo Industry Co., Ltd. Recording apparatus. 4,841,330, Cl. 355-245.000.
Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 4,840,928, Cl. 502-41.000.
Owen, Robert E.: *See—*
Miller, Bruce E.; and Owen, Robert E., 4,841,468, Cl. 364-754.000.
Ozaki, Minoru: *See—*
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Method of imaging an object by ultrasonic or electromagnetic waves. 4,841,489, Cl. 367-7.000.
Ozawa, Susumu: *See—*
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.
Ozawa, Tetsuo: *See—*
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Pabst, Otto, to Leitner, S.p.A. Mechanical transmission, particularly for cableway winches. 4,840,088, Cl. 74-661.000.
Pack, Roger N.; and Ahmad, Eddress. Footwear with pivotal toe. 4,839,972, Cl. 36-117.000.
Pallmar, Anders, to Alfa-Laval Marine and Power Engineering AB. Centrifugal separator and method of operating same. 4,840,612, Cl. 494-2.000.
Pamperin, John M.: *See—*
Rentmeester, Alan L.; and Pamperin, John M., 4,840,009, Cl. 53-373.000.
Panton, George S., Jr. Stretchable necktie. 4,839,925, Cl. 2-146.000.
Papenberg, Robert L., to Saxpy Computer Corporation. Data alignment system for random and block transfers of embedded subarrays of an array onto a system bus. 4,841,435, Cl. 364-200.000.
Pappenhagen, Albert R.: *See—*
Van Beveren, Shirley M.; and Pappenhagen, Albert R., 4,841,026, Cl. 530-394.000.
Pardners Unlimited, Inc.: *See—*
Bockenheuser, Charles A., 4,840,418, Cl. 296-91.000.

Parini, Ettore: *See—*
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.

Parker, Ivan: *See—*
Weekley, David L.; and Parker, Ivan, 4,840,297, Cl. 222-607.000.

Parker, Janice P.: *See—*
Yananton, Patrick; and Parker, Janice P., 4,840,140, Cl. 119-1.000.

Parks, Howard L., to Amdahl Corporation. Three-dimensional microelectronic package for semiconductor chips. 4,841,355, Cl. 357-82.000.

Parsen, Frank E.: *See—*
Chalilpoyil, Purush; Parsen, Frank E.; and Wang, Chih-Chung, 4,840,644, Cl. 29-623.100.

Parsons, Bryan N. V., to Jaguar Cars Limited. Method and apparatus for supercharging internal combustion engines. 4,840,164, Cl. 123-559.100.

Parsons, John A.: *See—*
Epstein, Joseph; Parsons, John A.; and Block, Frank, 4,840,911, Cl. 436-8.000.

Partridge, Randall D.: *See—*
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.

Paspek, Stephen C., to Standard Oil Company, The. Conversion of high boiling liquid organic materials to lower boiling materials. 4,840,725, Cl. 208-130.000.

Patel, Kalyanji U., to Minnesota Mining and Manufacturing Company. Treatment of fibrous substrates, such as carpet, with fluorochemical. 4,841,090, Cl. 558-437.000.

Patrick, John L.: *See—*
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., 4,841,248, Cl. 324-318.000.

Patterson, David W.: *See—*
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,839,958, Cl. 29-450.000.

Patterson, Richard J.: *See—*
Plewright, William B.; Weir, Kenneth O.; and Patterson, Richard J., 4,839,933, Cl. 5-81.00R.

Patti, Giuseppe: *See—*
Lentini, Salvatore; and Patti, Giuseppe, 4,841,161, Cl. 307-85.000.

Patzelt, Helmut: *See—*
Peitsmeier, Karl; and Patzelt, Helmut, 4,840,386, Cl. 277-212.0FB.
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.

Paul Stuart Kempf and Pilar Moreno Family Trust: *See—*
Kempf, Paul S., 4,840,455, Cl. 350-137.000.

Pauling, Horst; and Wehrli, Christof, to Hoffmann-La Roche Inc. Sulfinyl-ascorbic acid useful as an anti-oxidant. 4,841,070, Cl. 549-34.000.

Paulsen, Eric L.: *See—*
Meline, Harry R.; and Paulsen, Eric L., 4,841,226, Cl. 324-61.00R.

Paulson, Norman J.: *See—*
Drevfors, Gunnar; Corniea, Donald G.; and Paulson, Norman J., 4,840,205, Cl. 141-2.000.

Pavlisko, Joseph A.: *See—*
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,860, Cl. 430-59.000.
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,861, Cl. 430-59.000.

Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., to Gerber Scientific Instrument Company, The. Photohead system for positioning an aperture wheel and method of making an aperture disc. 4,841,316, Cl. 354-4.000.

Pawlowski, Georg; Hultsch, Guenter; and Mack, Gerhard, to Hoechst Aktiengesellschaft. Photosensitive composition based on a diazonium salt polycondensation product with an ester polymer binder having urethane group. 4,840,868, Cl. 430-155.000.

Peabody Coal Company: *See—*
Evans, Vernon C.; and Heidinger, George H., 4,841,159, Cl. 307-38.000.

Pearson, David B.; and Wissell, Robert A., to Westinghouse Electric Corp. Elevator hoistway door interlock. 4,840,254, Cl. 187-57.000.

Peitsmeier, Karl; and Patzelt, Helmut, to Daimler-Benz Aktiengesellschaft. Sound deadening dual sleeve sealing arrangement. 4,840,386, Cl. 277-212.0FB.

Pekarik, Alan J., to Glidden Company, The. Method of stabilizing epoxy-polyamide coatings. 4,840,980, Cl. 523-456.000.

Peleg, Yigal, to Stouffer Corporation, The. Method and appliance for cooking a frozen pot pie with microwave energy. 4,841,112, Cl. 219-10.55E.

Pellacini, Franco: *See—*
Della Bella, Davide; Carenzi, Angelo; Chiarino, Dario; and Pellacini, Franco, 4,840,936, Cl. 514-18.000.

Peltier, Bertrand, to Schlumberger Technology Corporation. Method of detecting a fluid influx which could lead to a blow-out during the drilling of a borehole. 4,840,061, Cl. 73-155.000.

Pelzl, Leo: *See—*
Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,840,573, Cl. 439-92.000.

Penard, Pierre: *See—*
Vigarie, Jean-Pierre; Carlach, Jean-Claude; and Penard, Pierre, 4,841,462, Cl. 364-723.000.

Penners, Gunther: *See—*
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.

Pennwalt Corporation: *See—*
Gastgeb, Raymond F., 4,841,256, Cl. 331-25.000.

Pensel, Werner: *See—*
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, 4,840,828, Cl. 428-120.000.

Peoples, Clarence A., Jr.: *See—*
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.

Peoples, P. Robert: *See—*
Mathews III, Marion J.; and Peoples, P. Robert, 4,841,087, Cl. 558-363.000.

Perceptron, Inc.: *See—*
Dewar, Robert; and Greer, Dale R., 4,841,460, Cl. 364-571.020.

Perez, Jose L. J., to Jesmar S.A. Doll with means for producing soap bubbles and having an anti-spill container. 4,840,597, Cl. 446-16.000.

Perfect View, Inc.: *See—*
Attar, Amir J., 4,840,919, Cl. 436-111.000.

Permian Research Corporation: *See—*
Hahn, Granville J., 4,839,969, Cl. 34-169.000.

Perrella, Guido, to Graham Fiber Glass Limited. Machine and process for sinuously folding a batt of non-woven fibrous material. 4,840,013, Cl. 53-429.000.

Perrin, Jean-Claude: *See—*
Loy, Fernand R.; Perrin, Jean-Claude; and Rollin, Joel, 4,840,465, Cl. 350-421.000.

Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, to Robert Bosch GmbH. Device for actuating a throttle valve. 4,840,349, Cl. 251-129.110.

Peters, Edward N.: *See—*
Fox, Daniel W.; Peters, Edward N.; and Sybert, Paul D., 4,841,015, Cl. 528-198.000.

Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, to AGFA-Gevaert Aktiengessellschaft. Color photographic heat development process. 4,840,871, Cl. 430-203.000.

Peters, Manfred; Helling, Gunter; and Reiff, Helmut, to Agfa-Gevaert Aktiengessellschaft. Color photographic recording material for the dye diffusion transfer process. 4,840,885, Cl. 430-559.000.

Petersen, Godber: *See—*
Kobler, Ingo; and Petersen, Godber, 4,840,365, Cl. 270-54.000.

Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 6,7-disubstituted 1-cycloproply-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acids. 4,840,954, Cl. 514-254.000.

Peterson, Miles L.: *See—*
MacLeod, Donald J.; Peterson, Miles L.; and Nowark, Charles G., Jr., 4,841,393, Cl. 360-98.070.

Petitou, Maurice: *See—*
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.

Petrolite Corporation: *See—*
Bellos, Thomas J.; and Lovett, Eva G., 4,840,748, Cl. 252-344.000.

Peyman, Gholam A . Method for modifying corneal curvature. 4,840,175, Cl. 128-303.100.

Pfalzgraf, Emile. Mounting device having a conical shank. 4,840,520, Cl. 409-232.000.

Pfau, Jean: *See—*
Simon, Laszlo; and Pfau, Jean, 4,840,652, Cl. 62-534.000.

Pfeiffer, Stanley: *See—*
Williamson, Edward; and Pfeiffer, Stanley, 4,840,771, Cl. 422-104.000.

Pfendler, Klaus: *See—*
Feigel, Josef; and Pfendler, Klaus, 4,841,186, Cl. 310-156.000.

Pfister, Theodor: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Pfizer Inc.: *See—*
Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, 4,841,078, Cl. 549-402.000.
Urban, Frank J., 4,841,079, Cl. 549-404.000.

Pfleiderer Industrie GmbH & Co., KG: *See—*
Vogt, Winold, 4,840,688, Cl. 156-39.000.

Pham, Xuan N.; and Wilson, John H., to International Business Machines Corporation. Voice buffer management. 4,841,574, Cl. 381-31.000.

Philip Morris Incorporated: *See—*
Brookman, Donald L.; Merrill, David E.; and Grollimund, Everett C., 4,840,694, Cl. 156-344.000.

Philips Kommunikations Industrie A: *See—*
Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, 4,840,480, Cl. 356-32.000.

Phillips, Donald A. Adjustment lock. 4,840,529, Cl. 411-397.000.

Phillips Petroleum Company: *See—*
Gaughan, Roger G., 4,841,018, Cl. 528-374.000.
Snell, James B.; and Skinner, Marjorie B., 4,840,997, Cl. 525-210.000.
Thorsrud, Agmund K., 4,840,758, Cl. 264-26.000.

Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., to Optical Coating Laboratory, Inc. Tamper evident optical device and article utilizing the same. 4,840,281, Cl. 215-230.000.

Photon Devices, Ltd.: *See—*
Waszkiewicz, Paul, 4,841,142, Cl. 250-227.000.

Picanol N.V.: *See*—
Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, 4,840,203, Cl. 139-453.000.

Picker International, Inc.: *See*—
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., 4,841,248, Cl. 324-318.000.

Pierburg GmbH: *See*—
Baumgartner, Hans; Brandstadter, Manfred; and Henke, Ulrich, 4,840,550, Cl. 418-150.000.

Pierce, Ben: *See*—
Chan, Aaron; Pierce, Ben; and Shafto, Leslie, 4,841,560, Cl. 379-29.000.

Pierce, Lawrence, Jr.: *See*—
Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., 4,840,635, Cl. 623-36.000.

Pierce, Matthew R.: *See*—
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.

Pierson, Lyndon G.: *See*—
George, Michael; Pierson, Lyndon G.; and Wilkins, Mark E., 4,841,550, Cl. 375-118.000.

Pillsbury Company, The: *See*—
Hyldon, Roy; and Bhatia, Usha, 4,840,806, Cl. 426-270.000.

Pilon, Terry C.: *See*—
Stroh, Alvin L.; and Pilon, Terry C., 4,840,336, Cl. 248-97.000.

Pilot Ink Co., Ltd.: *See*—
Ito, Akio; and Kato, Hiroshi, 4,840,509, Cl. 401-198.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Pilot Precision Kabushiki Kaisha: *See*—
Watanabe, Hiroyuki, 4,840,508, Cl. 401-65.000.

Pine, Bob G., to Applied Techniques Inc. Method and apparatus for cleaning a conveyor belt. 4,840,267, Cl. 198-498.000.

Pines, Eli: *See*—
Linsky, Gary; Cunningham, Timothy; and Pines, Eli, 4,840,626, Cl. 604-364.000.

Pingry, Larry J., to Allied Products Corporation. Disc mower. 4,840,019, Cl. 56-13.600.

Pioneer Electronic Corporation: *See*—
Akiyama, Toru, 4,841,379, Cl. 358-337.000.
Aoyagi, Yoshio, 4,841,505, Cl. 369-32.000.
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.
Kurihara, Toshihiko; and Funabashi, Tadashi, 4,841,517, Cl. 369-270.000.
Nozu, Shinsaku; Kase, Masao; and Yamashita, Masakazu, 4,841,518, Cl. 369-270.000.
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.
Yokosawa, Seiichi, 4,841,390, Cl. 360-77.140.

Pippert, Aaron J., to Utex Industries, Inc. Fishing lure apparatus with fish attractant. 4,839,983, Cl. 43-42.060.

Pistner, Timothy W., to Mobil Oil Corporation. Thermoplastic bag, bag pack and method of making the same. 4,840,610, Cl. 493-194.000.

Pittman, R. Aspen. High density headplate for a stringed instrument. 4,840,102, Cl. 84-293.000.

Pitts, Warren R., to Dennison Manufacturing Company. Method of mounting index tabs upon stenographic notebooks. 4,840,406, Cl. 281-1.000.

Piuze, Ronald L.: *See*—
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,840,225, Cl. 165-104.330.

Plavac, Frank: *See*—
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,840,744, Cl. 252-51.50A.

Plewright, William B.; Weir, Kenneth O.; and Patterson, Richard J. Patient transfer and conveying vehicle. 4,839,933, Cl. 5-81.00R.

Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Single-stage electrochemical image-forming process for reproduction layers. 4,840,709, Cl. 204-2.000.

Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Process for the electrochemical roughening of aluminum for use in printing plate supports. 4,840,713, Cl. 204-129.750.

Plutschuck, Lawrence; and Ochenski, James E., to GTE Valenite Corporation. Cutting insert. 4,840,518, Cl. 407-113.000.

Pochodylo, James M., to Eastman Kodak Company. Method for the production of ribavirin using high robose donor concentrations. 4,840,899, Cl. 435-87.000.

Podszun, Wolfgang: *See*—
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.

Pointu, Bernard: *See*—
Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, 4,840,442, Cl. 350-1.600.

Polgari, Istvan: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rilmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Polizzano, Robert A., to Nabisco Brands, Inc. Process and dough composition for producing multi-textured cookies containing hard fats. 4,840,803, Cl. 426-94.000.

Pollock, John A. Hermetically sealed feedthroughs and methods of making same. 4,841,101, Cl. 174-152.0GM.

Pomona Service & Supply Co., Inc.: *See*—
Muller, John E., Jr., 4,840,016, Cl. 53-459.000.

Pompe, Larry W. Contact lens cleaning device and method. 4,840,681, Cl. 134-42.000.

Pont-A-Mousson S.A.: *See*—
Defrance, Andre; and Hauer, Jean-Claude, 4,840,514, Cl. 404-25.000.

Pontbriand, James A. Counter top waste disposal unit. 4,839,931, Cl. 4-629.000.

Porta Systems Corp.: *See*—
De Luca, Paul V.; and Neuwirth, Helmuth, 4,840,572, Cl. 439-92.000.

Porter, John W., III. Endotracheal tube combination. 4,840,173, Cl. 128-207.150.

Pospisil, Richard E.: *See*—
Lubarsky, Andre; and Pospisil, Richard E., 4,841,437, Cl. 364-200.000.

Potthof, Erwin: *See*—
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, 4,841,493, Cl. 367-140.000.

Poumakis, Demetrius J., to United Technologies Corporation. Actuator control system with displacement sensor fault detection. 4,841,209, Cl. 318-564.000.

Poveromo, Melvin D. Tooth-die dowel-pin and locking assembly and method of making a dental model incorporating said assembly. 4,840,565, Cl. 433-74.000.

Prager, Lee A.; and Carbone, Douglas C., to GTE Products Corporation. Dual temperature hair curler utilizing a pair of PTC heaters. 4,841,127, Cl. 219-225.000.

Prange, Charles J., to Sewer Rodding Equipment Company. Automated sewer cleaning rodding machine. 4,839,936, Cl. 15-104.330.

Pratap, Siddharth B.: *See*—
Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., 4,841,217, Cl. 322-8.000.

Preferred Machining Corporation: *See*—
Stirbis, James S., 4,840,138, Cl. 118-694.000.

Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co.: *See*—
Bauer, Karl-Heinz; and Eckert, Gerold, 4,840,114, Cl. 98-2.000.

Preininger, Siegfried: *See*—
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, 4,840,171, Cl. 128-204.180.

Prendel, Peter W.: *See*—
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.

Prescott, Anthony D.: *See*—
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-419.00R.

Price, Zane A.; and Bentley, Douglas P. Invisible tie tail holder. 4,839,945, Cl. 24-49.00R.

Priesnitz, Uwe: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Prilik, Ronald J.; and Varner, James R., to International Business Machines Corporation. Read/write memory device with an embedded read-only pattern and method for providing same. 4,841,485, Cl. 365-201.000.

Primages, Inc.: *See*—
Chu, Mosi; Graziano, Anthony; and Kress, Kenneth, 4,840,504, Cl. 400-213.000.

Pritchard, Robert B., to Rolls-Royce plc. Brush seal manufacture. 4,839,997, Cl. 51-290.000.

Probasco, Timothy C. Device for lowering toilet seats. 4,839,928, Cl. 4-251.000.

Procter & Gamble Company, The: *See*—
Hardy, Frederick E.; and Walley, Darlene R., 4,840,738, Cl. 252-8.600.
Johnson, Philip S.; and Bakken, Theresa A., 4,840,786, Cl. 424-43.000.
Orr, Thomas V.; and Meyer, Gerard B., 4,840,789, Cl. 424-66.000.

Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., to Otis Engineering Corporation. Multiple position service seal unit with positive position indicating means. 4,840,229, Cl. 166-381.000.

Productive Products Limited: *See*—
Voorhees, John L.; and Kemp, James, 4,840,144, Cl. 119-96.000.

Prouty, David. Plug locking cover. 4,840,577, Cl. 439-373.000.

Provan, Alexander R.: *See*—
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., 4,840,335, Cl. 248-97.000.

Pryor, Michael J., to Olin Corporation. Method for making multi-layer and pin grid arrays. 4,840,654, Cl. 65-18.100.

Puippe, Jean-Claude. Process for the precise determination of the surface area of an electrically conducting shaped body. 4,840,708, Cl. 204-1.00T.

Pulse Electronics, Inc.: *See*—
Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., 4,840,056, Cl. 73-1.00H.

Purcell, John R.: *See*—
Burnett, Sibley C.; Purcell, John R.; Breneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.

Pursell, Robert F., to Ranco Incorporated of Delaware. Trip-free resetting mechanism for an on-off unit. 4,841,271, Cl. 337-320.000.
Quackenbush, John, to FBK International Corporation. Medical catheter with splined internal wall. 4,840,623, Cl. 604-280.000.
Quadranti, Marco; Schmidli, Wilheim; and Zoschke, Andreas, to Ciba-Geigy Corporation. Syrergistic composition and method for selective weed control in rice. 4,840,663, Cl. 71-93.000.
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, to Institut Francais du Petrole. Process for the production of hydrogen by catalytic reforming of methanol with water vapor. 4,840,783, Cl. 423-648.100.
Quantum Chemical Corporation: *See—*
Wild, Leslie; and Lee, Chun D., 4,840,996, Cl. 525-193.000.
Quest Medical, Inc.: *See—*
Abbott, Martyn S., 4,840,542, Cl. 417-9.000.
Quiel, John M., to Westinghouse Electric Corp. Waste disposal system. 4,840,130, Cl. 110-234.000.
Quist, William E.: *See—*
Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., 4,840,682, Cl. 148-12.70A.
R.H. Sheppard Co.: *See—*
Brouckson, Robert H., 4,840,244, Cl. 180-143.000.
Rabinovich, Eliezer M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Fabrication of high-silica glass article. 4,840,653, Cl. 65-3.120.
Rabloczky, Gyorgy: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Racine, Philippe: *See—*
Joulain, Daniel; Racine, Philippe; and Maire, Francoise, 4,840,792, Cl. 424-76.100.
Rafa Laboratories: *See—*
Ben-Sasson, Shmuel, 4,840,795, Cl. 424-690.000.
Rahmen mit System GmbH: *See—*
Walter, Eckhard, 4,839,974, Cl. 40-152.000.
Raikov, Nikolai N., to Tsentralnoe Proektno-Konstruktorskoe Bjuro Vsesojuznogo Rybopromyshlennogo Obiedinenia Azovo-Chernomorskogo Basseina. Machine for producing a triple-thread chain stitch for sewing webs over an edge. 4,840,134, Cl. 112-162.000.
Raiman Design, Inc.: *See—*
Raiskums, Olaf B.; and Mancel, James D., 4,840,689, Cl. 156-217.000.
Raiskums, Olaf B.; and Mancel, James D., to Raiman Design, Inc. Ornament production. 4,840,689, Cl. 156-217.000.
Ralfs, Colin A.; and Murdock, Anthony, to British Aerospace Public Limited Company. Laminate compression tester. 4,840,070, Cl. 73-818.000.
Rall, Richard R.: *See—*
Berg, Lloyd; and Rall, Richard R., 4,840,707, Cl. 203-51.000.
Rambo, Thomas A. Artificial reef. 4,840,516, Cl. 405-33.000.
Ranco Incorporated of Delaware: *See—*
Pursell, Robert F., 4,841,271, Cl. 337-320.000.
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., to NCR Corporation. Dry film development process for an aperture card printer. 4,841,343, Cl. 355-77.000.
Rasmussen, Jerald K.: *See—*
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.
Rathgeb, Peter M. Retractable guard for motor vehicle door. 4,839,991, Cl. 49-462.000.
Raubenheimer, Hans-Juergen: *See—*
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.
Raue, Roderich: *See—*
Harnisch, Horst; and Raue, Roderich, 4,841,052, Cl. 544-361.000.
Rauma-Repola Oy: *See—*
Malmsten, Erkki, 4,840,703, Cl. 162-49.000.
Ravet, Georges: *See—*
Gonnet, Olivier; Ravet, Georges; and Rousset, Jacky, 4,840,985, Cl. 524-425.000.
Ravex, Alain: *See—*
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.
Rawlins, P. J. Thomas. Fuel tank cleaning system. 4,840,732, Cl. 210-306.000.
Raychaudhuri, Dipankar; and Joseph, Kuriacose, to General Electric Company. Stabilization of random access packet CDMA networks. 4,841,527, Cl. 371-32.000.
Raychem Limited: *See—*
Towle, Ian D. H., 4,841,011, Cl. 528-125.000.
Towle, Ian D. H., 4,841,013, Cl. 528-125.000.
Towle, Ian D. H., 4,841,094, Cl. 560-73.000.
Raytheon Company: *See—*
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.
RCA Licensing Corporation: *See—*
Christopher, Todd J., 4,841,466, Cl. 364-733.000.
Reale, Serge: *See—*
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Rebentisch, Hugo E., to Unistrut International Corp. Fastener restrainer for framing system. 4,840,525, Cl. 411-85.000.
Reber, Werner. Front piece for shoes. 4,839,971, Cl. 36-77.00R.
Redco N.V.: *See—*
Baes, Emile, 4,840,672, Cl. 106-86.000.
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., to Integrated Genetics, Inc. Heteropolymeric protein. 4,840,896, Cl. 435-68.000.
Redken Laboratories, Inc.: *See—*
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., 4,840,791, Cl. 424-71.000.
Regan, Paul: *See—*
Flig, Alan Y.; and Regan, Paul, 4,841,287, Cl. 340-690.000.
Reichenberger, Helmut: *See—*
Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, 4,840,166, Cl. 128-24.00A.
Reid, Dwight K., to Betz Laboratories, Inc. Process for minimizing fouling of processing equipment. 4,840,720, Cl. 208-48.0AA.
Reiff, Helmut: *See—*
Peters, Manfred; Helling, Gunter; and Reiff, Helmut, 4,840,885, Cl. 430-559.000.
Reilard, Ulrich: *See—*
Jungmann, Andreas; and Reilard, Ulrich, 4,840,753, Cl. 261-76.000.
Reilly, Bernard J.; and Michels, Roger, to Extrusion Punch & Tool Co. Mixing plate for injection molding machine. 4,840,556, Cl. 425-543.000.
Reinartz, Hans-Dieter: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.
Reinecke, Paul: *See—*
Holmwood, Graham; Weissmuller, Joachim; Brandes, Wilhelm; and Reinecke, Paul, 4,840,961, Cl. 514-399.000.
Reinwall, Ernest W.: *See—*
Hagan, Robert A.; and Reinwall, Ernest W., 4,840,083, Cl. 74-574.000.
Reis, Gustave A. Smoke and liquid alarm. 4,841,282, Cl. 340-521.000.
Reisch, Wolfgang: *See—*
Rumpf, Bernd; and Reisch, Wolfgang, 4,841,451, Cl. 364-484.000.
Reischman, Paul T.: *See—*
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.
Remer, James N., to General Electric Company. Angled strut diaphragm spring. 4,840,457, Cl. 350-255.000.
Reneau, Raymond P. Router guide assembly and method of using same. 4,840,209, Cl. 144-371.000.
Renner, Gunter: *See—*
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.
Rentmeester, Alan L.; and Pamperin, John M., to FMC Corporation. Rotary film sealing and severing head for thermoplastics. 4,840,009, Cl. 53-373.000.
Restrick, Robert C., III: *See—*
Delaney, Robert H.; Kalmanek, Charles R., Jr.; and Restrick, Robert C., III, 4,841,295, Cl. 340-825.500.
Revlon, Inc.: *See—*
Lunderman, William; and Seidler, David, 4,840,288, Cl. 220-334.000.
Rew, James A.: *See—*
Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., 4,840,305, Cl. 228-232.000.
Rexnord Inc.: *See—*
Anderson, William B., 4,840,269, Cl. 198-822.000.
Rey, Charles A.: *See—*
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Reye, Catherine: *See—*
Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, 4,841,084, Cl. 556-464.000.
Rheinmetall GmbH: *See—*
Fischer, Helmut, 4,840,110, Cl. 89-46.000.
Rhode Island Hospital: *See—*
Carlson, Drew E., 4,840,182, Cl. 128-694.000.
Rhone-Poulenc Films: *See—*
Eyraud, Marcel, 4,840,836, Cl. 428-213.000.
Rhone Poulenc Nederlands B.V.: *See—*
Kowite, William J.; and Oestreicher, Stephen L., 4,840,660, Cl. 71-86.000.
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Bourgeaux, Pierre; and Riaud, Alain, 4,841,297, Cl. 341-11.000.
Ricerche di Schiena S.n.c. del Dr. Michele G. di Schiena & C.: *See—*
Di Schiena, Michele G.; and Orru, Vittoria, 4,840,964, Cl. 514-448.000.
Richard, Philippe; Soulage, Andre ; and Appel, Jean, to Office National d'Etudes et de Recherches Aerospatiales (ONERA). Installation for the detection and location by interferometry, in real time and at great distance of lightening strikes. 4,841,304, Cl. 342-460.000.
Richard Wolf GmbH: *See—*
Ams, Felix; and Schafer, Roland, 4,841,363, Cl. 358-98.000.
Richards Metal Company: *See—*
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-419.00R.
Richlen, Scott L., to United States of America, Energy. Corrosive resistant heat exchanger. 4,840,226, Cl. 165-134.100.

Richter, Hans-Jurgen, to Allstar Vergrauchsguter GmbH. Household board. 4,840,361, Cl. 269-289.00R.

Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr AB. Multiscreen pressure diffuser. 4,840,047, Cl. 68-181.00R.

Richter, Ole J.: *See—*
Richter, Johan C. F. C.; and Richter, Ole J., 4,840,047, Cl. 68-181.00R.

Ricoh Company, Ltd.: *See—*
Asami, Kazuo; and Ogasawara, Fumihiro, 4,841,373, Cl. 358-257.000.
Kammoto, Yoshiaki; and Saito, Masanori, 4,841,358, Cl. 358-75.000.
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.

Riebel, Hans-Jochem: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

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Riegler, Ernst: *See—*
Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, 4,841,542, Cl. 373-73.000.

Riesmeyer, Juergen, to Siemens Aktiengesellschaft. Circuit arrangement for a telephone station with earth connection to the central supply device. 4,841,568, Cl. 379-380.000.

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Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, 4,841,458, Cl. 364-557.000.

Rindfuss, Diane J. Arrangement for recording and indexing information. 4,841,387, Cl. 360-72.100.

Rinehart, Homer L. Outdoor grill with extractable food supporting rack. 4,840,118, Cl. 99-446.000.

Riollet, Gilbert: *See—*
Bourcier, Pierre; and Riollet, Gilbert, 4,840,539, Cl. 416-191.000.

Risman, Per O. G.: *See—*
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.

Robb, Kenneth P., Jr.: *See—*
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., 4,840,656, Cl. 65-85.000.

Robert Bosch GmbH: *See—*
Brunel, Andre, 4,840,162, Cl. 123-506.000.
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.
Karle, Anton, 4,840,155, Cl. 123-300.000.
Leiber, Heinz, 4,840,434, Cl. 303-113.000.
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, 4,840,349, Cl. 251-129.110.

Robert Mathys Co.: *See—*
Mathys, Robert, 4,840,631, Cl. 623-22.000.

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Joulain, Daniel; Racine, Philippe; and Maire, Francoise, 4,840,792, Cl. 424-76.100.

Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., to International Business Machine Corporation. Stuffed chamber ribbon cartridge. 4,840,503, Cl. 400-208.000.

Robinson, Deborah L.: *See—*
Sipes, Donald L., Jr.; and Robinson, Deborah L., 4,841,528, Cl. 372-22.000.

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Rockwell, Martin G.: *See—*
Charbonnier, Francis M.; Rockwell, Martin G.; and Benvegar, Carl E., 4,840,177, Cl. 128-419.00D.

Rode, Klaus: *See—*
Elsaesser, Andreas; and Rode, Klaus, 4,840,867, Cl. 430-156.000.

Roemer, Helmuth. Ram boring implement. 4,840,237, Cl. 175-19.000.

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Rogen, Neil E.: *See—*
Adnyana, Dewa N.; and Rogen, Neil E., 4,840,346, Cl. 251-1.300.

Roger Bullivant of Texas, Inc.: *See—*
Bullivant, Roger A., 4,840,517, Cl. 405-241.000.

Rogers, William H., to Sea Search, Inc. Spear gun tip assembly and method of use thereof. 4,839,979, Cl. 43-6.000.

Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, to Dragerwerk Aktiengesellschaft. Oxygen supply unit having an oxygen generator. 4,840,171, Cl. 128-204.180.

Rojas, Robert R. Multiple component comforter quilt. 4,839,934, Cl. 5-502.000.

Rolffs, Philip C. Synthetic ebony and method of producing the same (I). 4,840,637, Cl. 8-402.000.

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Szuminski, Gary F.; and Ward, Benjamin D., 4,840,329, Cl. 244-12.500.

Rolls-Royce Motors Limited: *See—*
Hill, Adrian C.; and Jepson, Derek, 4,840,206, Cl. 141-349.000.

Rolls-Royce plc: *See—*
Pritchard, Robert B., 4,839,997, Cl. 51-290.000.

Ronis S.A.: *See—*
Chappoux, Claude; Rouesnel, Bernard; and Gillet, Guy, 4,840,264, Cl. 194-212.000.

Rookstool, Gary H.: *See—*
Hollingsworth, John D.; and Rookstool, Gary H., 4,839,944, Cl. 19-105.000.

Rooney, Craig E., to Gareis, John. Compact eyeglass construction. 4,840,476, Cl. 351-63.000.

Root, Jeffrey M.: *See—*
Meyer, Richard S.; Root, Jeffrey M.; Campbell, Michael L.; and Winter, Daryl B., 4,840,815, Cl. 426-611.000.

Roquette Freres: *See—*
Boursier, Bernard, 4,840,797, Cl. 424-475.000.

Rose, Mark W., to Dalsat, Inc. Method of sectioning an antennae reflector. 4,841,305, Cl. 343-912.000.

Rose, William J., to Coleco Industries, Inc. Talking doll responsive to external signal. 4,840,602, Cl. 446-175.000.

Roselli, Peter J. C.: *See—*
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

Rosenberg, Martin: *See—*
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Rosenstein, Robert W.: *See—*
Nathans, Gene R.; and Rosenstein, Robert W., 4,841,024, Cl. 530-387.000.

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Ross, Colby M.: *See—*
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.

Rosshirt, Hermann: *See—*
Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, 4,841,243, Cl. 324-174.000.

Rossoff, Irving S. Method of preparing a sulfonamide-food color additive for detection of sulfonamides in animal feeds and pharmaceuticals preparations. 4,840,909, Cl. 436-20.000.

Roth, Rainer: *See—*
Haberrecker, Klaus; and Roth, Rainer, 4,841,557, Cl. 378-141.000.

Rouesnel, Bernard: *See—*
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Roussel, Bernard: *See—*
Dittmar, Andre ; Delhomme, Georges; Roussel, Bernard; and Chatonnet, Joseph, 4,841,543, Cl. 374-44.000.

Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, to Universite Paul Sabatier (Toulouse III). Compositions of transition metal manganites in the form of particles or ceramics, their preparation and their use in the production of thermistors. 4,840,925, Cl. 501-1.000.

Rousset, Jacky: *See—*
Gonnet, Olivier; Ravet, Georges; and Rousset, Jacky, 4,840,985, Cl. 524-425.000.

Rovenszky, Franz: *See—*
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,841,065, Cl. 548-238.000.

Rowe, Jay E., to Crompton & Knowles Corporation. Trichromatic combination of dyes for nylon. 4,840,643, Cl. 8-641.000.

Rowlett, Beb H.: *See—*
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Roy, Wolfgang: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

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Rubin, Kenneth L. Electronic card reader and financial asset games. 4,840,382, Cl. 273-237.000.

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Rudoi, Igor G.: *See—*
Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M., 4,841,537, Cl. 372-55.000.

Rudolph, Axel: *See—*
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Ruiz, Ariel: *See—*
Heng, Jean-Paul; Ruiz, Ariel; and Boissonnet, Alain, 4,840,579, Cl. 439-395.000.

Rumbolt, Robin B.; Guerinot, William F.; and Dargis, Daniel J., to North American Philips Corporation. Television customer control functions restorer. 4,841,368, Cl. 358-194.100.

Rumpf, Bernd; and Reisch, Wolfgang, to VDO Adolf Schindling AG. System for measuring the duration ratio of pulses of variable frequency. 4,841,451, Cl. 364-484.000.

Ruppen, Bruno: *See*—
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Russell, Robert H., to North American Philips Corporation. Apodization of ultrasound transmission. 4,841,492, Cl. 367-105.000.

Russo, James: *See*—
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Russo, Onofrio N., to Gas Energy, Inc. Plunger lock and key. 4,840,049, Cl. 70-34.000.

Ruvo Automation Corporation: *See*—
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Ryan, James G.: *See*—
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.

S.A.T. (Societe Anonyme de Telecommunications): *See*—
Michel, Royer, 4,841,351, Cl. 357-30.000.

S. D. Warren Company: *See*—
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Sa Schappe: *See*—
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Sabbadin, Antonio D.: *See*—
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Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, to Nippondenso Co., Ltd. High frequency wave absorbing ceramics. 4,840,926, Cl. 501-134.000.

Sada, Tomoya: *See*—
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Sadanobu, Jiro: *See*—
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Saegusa, Noboru, to NEC Corporation. Clock recovering device. 4,841,167, Cl. 307-269.000.

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Saell, Goesta; and Hirschberg, Jakub, to Siemens AG. Connector arrangement for a lead for an implantable stimulation device. 4,840,580, Cl. 439-431.000.

Sagane, Masahiko: *See*—
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Sagara, Masaaki: *See*—
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Sagawa, Masato: *See*—
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Saijo, Hiroyuki: *See*—
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Sailer, Erwin: *See*—
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St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., to General Motors Corporation. Method of using a robot for installing weather stripping in a door or like opening. 4,839,958, Cl. 29-450.000.

Saint-Gobain Vitrage: *See*—
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Saito, Akira: *See*—
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Saito, Harunobu: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.

Saito, Ikuhiro: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.

Saito, Kazuo; Saito, Toshihiko; and Kishimoto, Ken, to Kabushiki Kaisha Toshiba. Pulsating combustion system. 4,840,558, Cl. 431-1.000.

Saito, Koichi: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.

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Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, 4,840,608, Cl. 474-205.000.

Saito, Ryo: *See*—
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Saito, Shinichiro: *See*—
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Saito, Susumu: *See*—
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Saito, Takanobu: *See*—
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Saito, Toshihiko: *See*—
Saito, Kazuo; Saito, Toshihiko; and Kishimoto, Ken, 4,840,558, Cl. 431-1.000.

Saito, Yusaku: *See*—
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.

Saji, Miyuki: *See*—
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Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, to Aisin-Warner Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic control device for automatic transmissions. 4,840,092, Cl. 74-869.000.

Sakai, Katsuhisa: *See*—
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Sakai, Kunihiro: *See*—
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.

Sakaki, Toshiro: *See*—
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Sakakima, Hiroshi: *See*—
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Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, to Omron Tateisi Electronics Co. Slide switch. 4,841,109, Cl. 200-302.100.

Sakamoto, Noriaki: *See*—
Yamada, Koji; and Sakamoto, Noriaki, 4,840,037, Cl. 62-199.000.

Sakamoto, Seiji; and Yasumura, Kiyoshi, to Diafoil Company, Limited. Polyester film for magnetic recording tape. 4,840,830, Cl. 428-141.000.

Sakamoto, Yoshito, to Sumitomo Electric Industries, Ltd. Flame retardant heat-shrinkable tube. 4,840,987, Cl. 524-436.000.

Sakane, Takaaki; and Takeuchi, Kazuhiro, to Nippondenso Co., Ltd. Fan apparatus. 4,840,541, Cl. 416-223.00R.

Sakano, Shinji: *See*—
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.

Sakata, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Sealed-type lash adjuster. 4,840,151, Cl. 123-90.430.

Sakikiyama, Ryuzo: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.

Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi. Cryogenic refrigerator. 4,840,043, Cl. 62-51.200.

Sakuma, Hiroshi: *See*—
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Sakurai, Tadashi; and Fuchigami, Wataru, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust gas control means for engine. 4,840,029, Cl. 60-313.000.

Sakurai, Tadashi: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 4,840,847, Cl. 428-373.000.

Sakurai, Yasuo: *See*—
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Saldarelli, Thomas A.: *See*—
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Saller, Helmut: *See*—
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Salzman, Robert S.: *See*—
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Samarin, Alexei J.: *See*—
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Sampson, Stephen A.; Dambach, Philip J.; and Brunker, David L., to Molex Incorporated. Shielded fiber optic connector assembly. 4,840,451, Cl. 350-96.200.

Samsung Electronics Co., Ltd.: *See*—
Dong-Il, Song, 4,841,171, Cl. 307-355.000.

Samuels, Louann B.: *See*—
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., 4,840,503, Cl. 400-208.000.

Sanada, Kohji, to NEC Corporation. Semiconductor memory circuit with improved timing and delay control for data read out. 4,841,488, Cl. 365-233.000.
Sanchez, Joseph P.: *See*—
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Sanden Corporation: *See*—
Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, 4,840,308, Cl. 236-13.000.
Kazuhiko, Takai, 4,840,039, Cl. 62-244.000.
Nara, Kenichi; and Takahashi, Ryoichi, 4,840,439, Cl. 312-116.000.
Sato, Motoharu, 4,840,038, Cl. 62-210.000.
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, to BASF Aktiengesellschaft. Process for producing combustible sewage sludge filter cakes in filter presses. 4,840,736, Cl. 210-727.000.
Sandkuhl, Jurgen: *See*—
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.
Sandoz Ltd.: *See*—
Auerbach, Gunther; and Moser, Helmut A., 4,840,642, Cl. 8-549.000.
Sandoz Pharm. Corp.: *See*—
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Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.
Sangen, Masashi: *See*—
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Sanmei Denki Kabushiki Kaisha: *See*—
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Sanner, Axel: *See*—
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Sano, Hiroshi: *See*—
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Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,840,843, Cl. 428-336.000.
Sano, Shojiro; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Desensitizer composition. 4,840,927, Cl. 503-201.000.
Sano, Tetsuo: *See*—
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Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, to Tamura Electric Works, Ltd. Bucket type coin accumulation apparatus. 4,841,563, Cl. 379-150.000.
Sanofi: *See*—
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.
Sanofi S.A.: *See*—
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.
Santel, Hans-Joachim: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.
Sanyo Electric Co., Ltd.: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, 4,840,858, Cl. 429-197.000.
Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, 4,841,370, Cl. 358-227.000.
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Toguchi, Akira, 4,841,381, Cl. 360-10.300.
Saotome, Shigeru, to Fuji Photo Film Co., Ltd. Image read-out and recording apparatus. 4,841,147, Cl. 250-327.200.
Sarossy nee Kincsesy, Judit: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Saruwatari, Hidetoshi: *See*—
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.
Sarwinski, Raymond E.: *See*—
Burnett, Sibley C.; Purcell, John R.; Breneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.
Sasago, Masaru: *See*—
Endo, Masayuki; Sasago, Masaru; and Ogawa, Kazufumi, 4,840,872, Cl. 430-273.000.
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, 4,841,341, Cl. 355-43.000.
Sasaki, Akihiko; and Atsumi, Hiroaki, to Fuji Photo Film Co., Ltd. Audio recording device. 4,841,382, Cl. 360-32.000.
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, to Hitachi, Ltd. Thermal transfer printer having an improved thermal head to improve ink transfer eveness. 4,840,500, Cl. 400-120.000.
Sasaki, Gordon H., to Dow Corning Wright. Lozenge-shaped low profile injection reservoir. 4,840,190, Cl. 128-897.000.
Sasaki, Hideharu: *See*—
Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.
Sasaki, Hiroshi: *See*—
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, 4,841,514, Cl. 369-100.000.
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, to Fuji Photo Film Co., Ltd. Fine porous membrane and process for producing the same. 4,840,733, Cl. 210-500.410.
Sasaki, Kiyoshi: *See*—
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.
Sasaki, Naoko: *See*—
Oda, Masatsugu; Sasaki, Naoko; Sakaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.
Sasaki, Nobukazu: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.
Sasaki, Ryoichi, to Brother Kogyo Kabushiki Kaisha. Display control device for a typewriter which displays both input characters and format information. 4,840,499, Cl. 400-83.000.
Sasaki, Takashi: *See*—
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.
Sasaki, Teruji: *See*—
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, 4,840,014, Cl. 53-432.000.
Sasaki, Toshimi: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.
Sasaki, Yuuichi: *See*—
Yoshida, Akira; and Sasaki, Yuuichi, 4,841,438, Cl. 364-200.000.
Sasib S.p.A.: *See*—
Gherardi, Gian L., 4,840,266, Cl. 198-471.100.
Sasse, Klaus: *See*—
Hagemann, Hermann; and Sasse, Klaus, 4,841,089, Cl. 558-412.000.
Sato, Daiki: *See*—
Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, 4,841,144, Cl. 250-239.000.
Sato, Fumihide: *See*—
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.
Sato, Kensaku, to Hirose Electric Co., Ltd. Electrical contact. 4,840,578, Cl. 439-395.000.
Sato, Motoharu, to Sanden Corporation. Control device for use in a refrigeration circuit. 4,840,038, Cl. 62-210.000.
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, to Toyo Seikan Kaisha Ltd. Butt-welded cans and process for manufacturing the same. 4,840,304, Cl. 228-214.000.
Sato, Osamu: *See*—
Kawasaki, Masahiro; and Sato, Osamu, 4,841,322, Cl. 354-400.000.
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, to NTN Toyo Bearing Co., Ltd. Grease for homokinetic joint. 4,840,740, Cl. 252-32.70E.
Sato, Yasuhiro; and Haraguchi, Kazuo, to Kabushiki Kaisha Maki Seisakusho. Object distributing and supplying method and apparatus. 4,840,265, Cl. 198-446.000.
Sato, Yoshio: *See*—
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, 4,841,514, Cl. 369-100.000.
Sato, Yutaka: *See*—
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, 4,840,180, Cl. 128-661.080.
Satoh, Isao: *See*—
Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, 4,841,498, Cl. 369-32.000.
Satoh, Kazumasa: *See*—
Kobayashi, Susumu; and Satoh, Kazumasa, 4,840,620, Cl. 604-246.000.
Satoh, Keiji: *See*—
Kozuki, Susumu; and Satoh, Keiji, 4,841,380, Cl. 360-10.200.
Satoh, Shin: *See*—
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, to Matsushita Electric Industrial Co., Ltd. Amorphous magnetic head. 4,841,401, Cl. 360-125.000.
Saunders, Anne L.; and Fields, John G. Insect guard system and method of use. 4,839,984, Cl. 43-112.000.

Saupe, Juergen: *See*—
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.

Saviotti, Vanni: *See*—
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, 4,841,565, Cl. 379-413.000.

Sawai, Eisuke: *See*—
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.

Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, to Teijin Ltd. Process for preparation of high-performance grade carbon fibers. 4,840,762, Cl. 264-29.200.

Sawamoto, Hirokazu; Omura, Takashi; and Harada, Naoki, to Sumitomo Chemical Company, Limited. Dioxazine compound having vinylsulfone type fiber reactive group. 4,841,048, Cl. 544-74.000.

Sawamura, Masataka: *See*—
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.

Sawyer, Joanna D.: *See*—
Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., 4,840,898, Cl. 435-87.000.

Saxena, Vinit, to Sepragen Corporation. Chromatography system using horizontal flow columns. 4,840,730, Cl. 210-198.200.

Saxpy Computer Corporation: *See*—
Papenberg, Robert L., 4,841,435, Cl. 364-200.000.

Scaglione, Mark W.: *See*—
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., 4,841,115, Cl. 219-60.00A.

Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., to Columbia University in the City of New York, The Trustees of. Method for detecting a marker for essential hypertension and diagnostic use thereof. 4,840,894, Cl. 435-7.000.

Schaefer, Joseph G.: *See*—
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.

Schafer, Roland: *See*—
Ams, Felix; and Schafer, Roland, 4,841,363, Cl. 358-98.000.

Schaper, Uwe: *See*—
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, 4,840,349, Cl. 251-129.110.

Schauflinger, Hans: *See*—
Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, 4,841,241, Cl. 324-158.00F.

Scheffel, Gary W.: *See*—
Gausman, Theodore J.; and Scheffel, Gary W., 4,840,191, Cl. 137-15.000.

Scheffler, Gerhard: *See*—
Engel, Jurgen; and Scheffler, Gerhard, 4,841,047, Cl. 540-599.000.

Schenck, Frederick: *See*—
Edelstein, William A.; and Schenck, Frederick, 4,840,700, Cl. 156-634.000.

Schenk, Gunther: *See*—
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.

Schering Corporation: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Schick, Gerald: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Schiel, Lothar, to Alfred Teves GmbH. Electromagnetically actuatable three-way/two-position directional control valve. 4,840,193, Cl. 137-627.500.

Schiering, Rolf, to Deutsche AG fur Unterhaltungeselectronic OHG. Cassette recorder with recording programming. 4,841,386, Cl. 360-69.000.

Schinazi, Raymond F.: *See*—
Chu, Chung K.; and Schinazi, Raymond F., 4,841,039, Cl. 536-29.000.

Schindler, Bernd: *See*—
Bauser, Herbert; Schindler, Bernd; and Chmiel, Horst, 4,840,636, Cl. 8-115.520.

Schlossman, Stuart F.: *See*—
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

Schlumberger Technologies, Inc.: *See*—
Sloane, Edwin A., 4,841,471, Cl. 364-825.000.

Schlumberger Technology Corporation: *See*—
Carron, Didier, 4,841,490, Cl. 367-38.000.
Peltier, Bertrand, 4,840,061, Cl. 73-155.000.

Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, to Battelle-Institut e.V. Method for testing components of transparent material for surface irregularities and occlusions. 4,841,139, Cl. 250-223.00R.

Schmid, Frederick: *See*—
Khattak, Chandra P.; White, Vernon E.; Schmid, Frederick; and Wohlgemuth, John H., 4,840,699, Cl. -//.000.

Schmidli, Wilheim: *See*—
Quadranti, Marco; Schmidli, Wilheim; and Zoschke, Andreas, 4,840,663, Cl. 71-93.000.

Schmidt, Dieter: *See*—
Zipprath, Michael; and Schmidt, Dieter, 4,840,160, Cl. 123-467.000.

Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Lacquer, and process for producing anti-corrosion coatings. 4,840,666, Cl. 106-14.050.

Schmidt, Lothar: *See*—
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, 4,840,349, Cl. 251-129.110.

Schmidt, Paul. Pneumatic ram boring machine. 4,840,234, Cl. 173-90.000.

Schmidt, Robert R.: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Schmidt, Wolf-Dieter, to Draegerwerk AG. Process for producing a hollow fiber mass transfer module and module produced by this process. 4,840,227, Cl. 165-162.000.

Schmieder, Ronald R.: *See*—
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., 4,840,335, Cl. 248-97.000.

Schneider, Bernhard: *See*—
Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, 4,841,139, Cl. 250-223.00R.

Schneider, Eckhard, to Man - Roland Druckmaschinen AG. Combination folding and cut product attachment apparatus. 4,840,364, Cl. 270-38.000.

Schneider, Karl D. Transportation of hospital patients. 4,840,391, Cl. 280-304.100.

Schneider, Matthew L.: *See*—
Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, 4,841,243, Cl. 324-174.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Kutner, Andrzej; and Schnoes, Heinrich K., 4,841,038, Cl. 536-27.000.

Schodl, Richard, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Apparatus for measuring flow vectors in gas currents. 4,840,486, Cl. 356-338.000.

Scholpp, Werner, to Montres Rado S.A. Articulated wristlet. 4,840,044, Cl. 63-4.000.

Scholze, Horst: *See*—
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.

Schonlau, Juergen; Birkenbach, Alfred; and Harth, Ralf, to Alfred Teves GmbH. Pressure control device, in particular for pressure-fluid-operable brake systems of automotive vehicles. 4,840,433, Cl. 303-9.680.

Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. DC-supply arrangement for a telecommunication line. 4,841,564, Cl. 379-413.000.

Schranz, Karl-Wilhelm: *See*—
Ohlschlager, Hans; Schranz, Karl-Wilhelm; and Sobel, Johannes, 4,840,890, Cl. 430-622.000.

Schraven, Petrus E. G.; and Jacobs, Jan A. M. H., to Smitweld B.V. Packing material for relatively rigid objects and method for packing electrodes. 4,840,831, Cl. 428-152.000.

Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. Pyridine-enamines. 4,841,059, Cl. 546-312.000.

Schroeder, Karl S. Sheet music binder. 4,840,407, Cl. 281-48.000.

Schubert & Salzer Maschinenfabrik: *See*—
Karl, Rupert; and Becker, Rudolf, 4,840,022, Cl. 57-263.000.

Schuetz, Robert W. Amusement projectile device. 4,840,598, Cl. 446-52.000.

Schultz, Gert, to Stormax International A/S. Method of continuously processing and packing elongated articles such as coherent pairs of chopsticks and an apparatus for carrying out the method. 4,840,015, Cl. 53-435.000.

Schultz, Gert, to Stormax International A/S. Method of manufacturing oblong wooden articles to be used for the manufacture of coupled-together pairs of chopsticks. 4,840,208, Cl. 144-367.000.

Schultz, Paul B.; and Yarkosky, Eugene F., to Enthone, Incorporated. Electroless nickel plating of aluminum. 4,840,820, Cl. 427-305.000.

Schulz, Frank: *See*—
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, 4,840,171, Cl. 128-204.180.

Schumacher, John E., III, to Action Technologies, Inc. Apparatus and method for plasma treating of circuit boards. 4,840,702, Cl. 156-643.000.

Schuster, Rudolf: *See*—
Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, 4,841,241, Cl. 324-158.00F.

Schuyler, Martin: *See*—
Cox deceased, Duncan B.; and Schuyler, Martin, 4,841,124, Cl. 219-201.000.

Schvester, Pascal, to American Air Liquide. Sealing cap for liquid food or beverage containers. 4,840,280, Cl. 215-228.000.

Schwander, Hansrudolf: *See*—
Aeschlimann, Peter; and Schwander, Hansrudolf, 4,841,028, Cl. 534-629.000.

Schwark, Hubert: *See*—
Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, 4,840,166, Cl. 128-24.00A.

Schwarz, Volker: *See—*
Notz, Wolfgang; Schwarz, Volker; and Augustin, Ulrich, 4,840,060, Cl. 73-119.00A.
Schwarz, William M., to Xerox Corporation. Ink compositions. 4,840,674, Cl. 106-22.000.
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, to Servimetal. Apparatus for studying quenching fluids and quenchability of materials. 4,840,353, Cl. 266-80.000.
Scientific Design Company, Inc.: *See—*
Armstrong, William D., 4,841,080, Cl. 549-536.000.
Harvey, Robert J., 4,841,072, Cl. 549-230.000.
Scriabine, Alexander: *See—*
Sterzel, R. Bernd; and Scriabine, Alexander, 4,840,960, Cl. 514-356.000.
Sea Search, Inc.: *See—*
Rogers, William H., 4,839,979, Cl. 43-6.000.
Seagate Technology, Inc.: *See—*
MacLeod, Donald J.; Peterson, Miles L.; and Nowark, Charles G., Jr., 4,841,393, Cl. 360-98.070.
SECO Industries, Inc.: *See—*
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.
See-Me Lights Corp.: *See—*
Irie, Tsutomu, 4,841,199, Cl. 315-83.000.
Seel, Holger: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Segal, Alan J. Dental measuring apparatus. 4,840,564, Cl. 433-72.000.
Segatz, Wilhelm, to ARA - Werk Kramer GmbH & Co. Apparatus for discharging a bead of pasty material from a flexible bag. 4,840,293, Cl. 222-94.000.
Seibert, Kenneth D.: *See—*
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.
Seichter, Werner: *See—*
Lieske, Normen; and Seichter, Werner, 4,841,525, Cl. 371-21.000.
Seidel, Peter; Pelzl, Leo; and Zell, Karl, to Siemens Aktiengesellschaft. Mechanism for connecting shielding caps of multi-pole plugs to the ground potential layers of a mother board. 4,840,573, Cl. 439-92.000.
Seidler, David: *See—*
Lunderman, William; and Seidler, David, 4,840,288, Cl. 220-334.000.
Seiffarth, Werner: *See—*
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.
Seitz, Karl, to Ciba-Geigy Corporation. Reactive dyes of the dioxazine series. 4,841,049, Cl. 544-76.000.
Seki, Fumio, to Yoshida Kogyo K. K. Fastener conveying apparatus for fastener assembling machine. 4,840,301, Cl. 227-139.000.
Sekiya, Shinji, to Disco Abrasive Systems, Ltd. Method and apparatus for machining hard, brittle and difficultly-machinable workpieces. 4,839,996, Cl. 51-281.00R.
Sekmakas, Kazys, to DeSoto, Inc. Aqueous dispersions of partially cross-linked emulsion copolymers. 4,840,991, Cl. 524-812.000.
Self, Colin H., to Cambridge Patent Development Limited. Monoclonal antibodies reactive with immune complexes. 4,840,895, Cl. 435-7.000.
Sendvac M. Knape GmbH & Co. Maschinen und Anlagen KG: *See—*
Knape, Michael, 4,840,691, Cl. 156-245.000.
Senft, Helmut; and Hasenrath, Peter, to Maschinenfabrik Andritz Actiengesellschaft. Device for sealing shaft bearings or shaft bearing housings. 4,840,385, Cl. 277-53.000.
Sensor Technologies, Inc.: *See—*
Fiori, David, Jr., 4,841,245, Cl. 324-208.000.
Seo, Naobumi: *See—*
Murakami, Teruo; and Seo, Naobumi, 4,841,502, Cl. 369-13.000.
Sepragen Corporation: *See—*
Saxena, Vinit, 4,840,730, Cl. 210-198.200.
Sera, Hidefuji: *See—*
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Servimetal: *See—*
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.
Seto, Nobuyuki: *See—*
Kose, Junichi; and Seto, Nobuyuki, 4,841,321, Cl. 354-324.000.
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., to ST International. Orbital weldhead. 4,841,115, Cl. 219-60.00A.
Sewer Rodding Equipment Company: *See—*
Prange, Charles J., 4,839,936, Cl. 15-104.330.
Seymour, George W. Controlling characteristics of a pulp mat on a pulp washing surface. 4,840,704, Cl. 162-49.000.
SGS Microelecttronica SpA: *See—*
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, 4,841,565, Cl. 379-413.000.
Shadwick, David T.: *See—*
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., 4,840,503, Cl. 400-208.000.
Shafto, Leslie: *See—*
Chan, Aaron; Pierce, Ben; and Shafto, Leslie, 4,841,560, Cl. 379-29.000.
Shamblin, Judy A. Shower dispensing head. 4,840,311, Cl. 239-74.000.
Shaner, Richard L. Heat exchanger having metal wire screens, and method of making stack of screens therefor. 4,840,228, Cl. 165-165.000.
Sharp Corporation: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Sharp Kabushiki Kaisha: *See—*
Edamura, Kaoru, 4,841,125, Cl. 219-506.000.
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, 4,841,533, Cl. 372-45.000.
Kotani, Matahira; Hayashi, Motohiko; and Yamanoue, Masafumi, 4,841,374, Cl. 358-280.000.
Kurokawa, Yasuyoshi, 4,840,505, Cl. 400-697.100.
Tsuji, Masaru, 4,840,300, Cl. 226-187.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.
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Drent, Eit, 4,841,020, Cl. 528-392.000.
Hunter, Clifford P., 4,840,906, Cl. 435-240.490.
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Sheppa, Alexander: *See—*
Calcagni, Robert A.; and Sheppa, Alexander, 4,839,935, Cl. 14-24.000.
Sherman, Lawrence: *See—*
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Sheu, Yea-Dean, to Eastman Kodak Company. Method of interface state reduction in MNOS capacitors. 4,840,917, Cl. 437-10.000.
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Shibagaki, Makoto: *See—*
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Shibata, Hitoshi: *See—*
Ushida, Masahiko; and Shibata, Hitoshi, 4,841,155, Cl. 250-463.100.
Shibata, Satoshi: *See—*
Ueda, Michio; and Shibata, Satoshi, 4,841,214, Cl. 318-696.000.
Shibuya, Koichi: *See—*
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.
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Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.
Shigaki, Takao: *See—*
Urabe, Hitoshi; Shigaki, Takao; and Shimazaki, Osamu, 4,841,362, Cl. 358-80.000.
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Shigemitsu, Fumiaki; Usuda, Kinya; and Nomaki, Tatsuo, to Kabushiki Kaisha Toshiba. Method of forming resist pattern. 4,840,874, Cl. 430-296.000.
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Shigeta, Yoshifumi: *See—*
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, 4,840,296, Cl. 222-600.000.
Shiho, Makoto: *See—*
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Shiloh, Adam: *See—*
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Shiloh, Avraham; Shiloh, Adam; and Shiloh, Peretz J., 4,840,204, Cl. 140-105.000.
Shima, Hisaharu: *See—*
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Shima, Kenji: *See—*
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Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Shimada, Makoto, to Tachi-S Co., Ltd. Automotive seat and method of forming same. 4,840,430, Cl. 297-452.000.
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Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,840,081, Cl. 74-502.200.
Nagano, Masashi, 4,840,085, Cl. 74-594.400.
Yasui, Toshihiko, 4,839,981, Cl. 43-18.100.
Shimano, Yasunao: *See*—
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Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for producing cyclic amines. 4,841,061, Cl. 546-184.000.
Shimasaki, Yuuji: *See*—
Hino, Youichi; Shimasaki, Yuuji; and Ueshima, Michio, 4,841,060, Cl. 546-184.000.
Shimazaki, Hirato: *See*—
Kajita, Ryota; Esaki, Hiroshi; and Shimazaki, Hirato, 4,840,380, Cl. 273-77.00A.
Shimazaki, Osamu: *See*—
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Shimizu, Kozo: *See*—
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Shimizu, Masahisa: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Shimizu, Noboru: *See*—
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Shimizu, Tetsuo; and Hosokawa, Kazutaka, to Daikin Industries Ltd. Modified polytetrafluoroethylene fine powder and production of the same. 4,840,998, Cl. 525-276.000.
Shimoda, Hisanori: *See*—
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.
Shimomura, Akihiro: *See*—
Usami, Toshimasa; Hatakeyama, Seiji; and Shimomura, Akihiro, 4,840,933, Cl. 503-213.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Mori, Shigeru; and Takahashi, Takayuki, 4,840,739, Cl. 252-17.000.
Shin, Un Shik: *See*—
Choi, Hae Y., 4,839,926, Cl. 2-199.000.
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Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, 4,840,875, Cl. 430-309.000.
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Okada, Yoshimi; Kimura, Masao; and Okubo, Kazuo, 4,841,216, Cl. 322-10.000.
Shinozaki, Kaoru: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Shinozaki, Shinichiro: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.
Shionogi & Co., Ltd.: *See*—
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Shiozaki, Ryozi; Kaji, Atsuhiko; Saijo, Hiroyuki; and Deguchi, Katsuhiko, to Kao Corporation. Liquid cleanser composition containing an abrasive crystalline aluminosilicate zeolite aggregate. 4,840,746, Cl. 252-174.250.
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, to Nippon Kayaku Kabushiki Kaisha. Phenylpiperazine derivatives. 4,841,051, Cl. 544-287.000.
Shiozawa, Hiroaki: *See*—
Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000.
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Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Shirasaki, Yoshikazu; and Inuzuka, Kenichi, to Toyo Boseki Kabushiki Kaisha. Fiber reinforced plastic solid or hollow molded article. 4,840,826, Cl. 428-36.910.
Shirasu, Hirotoshi: *See*—
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.
Shiseido Co., Ltd.: *See*—
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.
Shitanoki, Kazuaki, to Honda Giken Kogyo Kabushiki Kaisha. Steering device for vehicles. 4,840,078, Cl. 74-484.00R.
Shizukuishi, Makoto; and Kondo, Ryuji, to Fuji Photo Film Co., Ltd. Solid state image pickup device. 4,841,348, Cl. 357-30.000.
Shizuoka Seiki Co., Ltd.: *See*—
Sugimoto, Naoto, 4,841,230, Cl. 324-65.00R.
Shoji, Hisashi: *See*—
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,841,332, Cl. 355-251.000.
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, 4,841,337, Cl. 355-157.000.
Shope, William H., to Beckman Instruments, Inc. Variable volume flow cell. 4,841,151, Cl. 250-364.000.
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Cogert, Harmon I., 4,841,378, Cl. 358-335.000.
Shuda, Etsuji: *See*—
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Sibazaki, Syogo: *See*—
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Siegel, Carole E.: *See*—
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Siegl, Walter O.; and Chattha, Mohinder S., to Ford Motor Company. Metal-chelating diphenolamine oligomers for corrosion inhibition of metal substrates. 4,840,667, Cl. 106-14.150.
Siemens AG: *See*—
Saell, Goesta; and Hirschberg, Jakub, 4,840,580, Cl. 439-431.000.
Siemens Aktiengesellschaft: *See*—
Altendorf, Hans-Walter, 4,840,563, Cl. 433-29.000.
Bibracher, Wilhelm; and Hauser, Josef, 4,840,595, Cl. 445-28.000.
Birkholz, Ulrich; Haertl, Christof; and Nassler, Peter, 4,840,249, Cl. 181-129.000.
Brunner, Matthias, 4,841,242, Cl. 324-158.00R.
De Man, Erik; and Meier, Stefan, 4,841,175, Cl. 307-475.000.
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000.
Foell, Helmut; and Lehmann, Volker, 4,841,239, Cl. 324-158.00R.
Goetze, Werner; Mayr, Ernst; Oestreich, Ulrich; and Saller, Helmut, 4,839,970, Cl. 350-96.230.
Haberrecker, Klaus; and Roth, Rainer, 4,841,557, Cl. 378-141.000.
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.
Hartmann, Gunter; Swoboda, Ralf; and Lang, Robert, 4,839,954, Cl. 29-235.000.
Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, 4,841,241, Cl. 324-158.00F.
Jelinek, Horst, 4,840,129, Cl. 110-229.000.
Kessler, Hartmut, 4,841,411, Cl. 361-323.000.
Koch, Rudolf, 4,841,222, Cl. 323-311.000.
Kraus, Rainer, 4,841,180, Cl. 307-530.000.
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.
Kuenemund, Ronald; and Noll, Tobias, 4,841,469, Cl. 364-754.000.
Lekholm, Anders; Fahlstroem, Ulf; and Groothoff, Hermann, 4,840,186, Cl. 128-784.000.
Lieske, Normen; and Seichter, Werner, 4,841,525, Cl. 371-21.000.
Lueers, Wilbrand, 4,840,125, Cl. 104-292.000.
Mueller, Gottfried, 4,841,421, Cl. 362-279.000.
Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, 4,840,166, Cl. 128-24.00A.
Oestreich, Ulrich; and Giebel, Wolfgang, 4,841,103, Cl. 174-70.00S.
Riesmeyer, Juergen, 4,841,568, Cl. 379-380.000.
Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,840,573, Cl. 439-92.000.
Stockl, Klaus, 4,840,429, Cl. 297-409.000.
Volejnik, Wilhelm, 4,841,548, Cl. 375-110.000.
Siemens Aktiengesellschat: *See*—
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Siemens Atiengesellschaft: *See*—
Heinen, Jochen, 4,841,344, Cl. 357-17.000.
Siemens Elema AB: *See*—
Olsson, Sven G.; and Jonson, Bjorn, 4,840,167, Cl. 128-28.000.
Sig Schweizerische Industrie-Gesellschaft: *See*—
Dietzsch, Claudius R., 4,840,224, Cl. 165-104.260.
Sikorski, Siegfried, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Axial guide blade assembly for a compressor stator. 4,840,536, Cl. 415-190.000.
Siliconix Incorporated: *See*—
Harnden, James A., 4,841,166, Cl. 307-246.000.
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, to SGS Microelecttronica SpA. Monolithically integratable telephone circuit for feeding a subscriber's telephone line. 4,841,565, Cl. 379-413.000.

Silimed Silicone E Instrumental Medico-Cirurgico e Hospitalar Ltda.: *See*—
Bustos, Ricardo A., 4,840,629, Cl. 623-8.000.

Silver, Jack: *See*—
Hider, Robert C.; Kontoghiorghes, George; and Silver, Jack, 4,840,958, Cl. 514-348.000.

Silverman, Edward J. Safety switch light fence. 4,840,248, Cl. 180-272.000.

Silvestri, George J., Jr., to Westinghouse Electric Corp. Axial flow steam turbine. 4,840,537, Cl. 415-202.000.

Simmonds Precision: *See*—
Spillman, William B., Jr., 4,840,481, Cl. 356-32.000.

Simmonds Precision Products, Inc.: *See*—
Maier, Lawrence C., 4,841,227, Cl. 324-61.00R.

Simon, Allen, to Four Paws Products, Ltd. Pet food dispenser. 4,840,143, Cl. 119-52.00R.

Simon, Laszlo; and Pfau, Jean, to Coldeco S.A. Method of generating and using cold, and device for implementing such method. 4,840,652, Cl. 62-534.000.

Simon, Michel: *See*—
Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, 4,840,750, Cl. 260-544.00A.

Simpson, Paul J.: *See*—
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

Simpson, William: *See*—
Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.

Sims, Clinton N. Crossed cylinder lenses refractor with three-lens variable crossed cylinder assembly and method of use. 4,840,479, Cl. 351-235.000.

Singer, Stephen P.: *See*—
Mooberry, Jared B.; and Singer, Stephen P., 4,840,884, Cl. 430-557.000.

Sintobrator, Ltd.: *See*—
Ishida, Takeo; Hagiwara, Hiroshi; and Kakumu, Ichizo, 4,839,992, Cl. 51-5.00D.

Sipes, Donald L., Jr.; and Robinson, Deborah L., to California Institute of Technology. Frequency doubled, cavity dumped feedback laser. 4,841,528, Cl. 372-22.000.

Sircar, Ila, to Warner-Lambert Company. 6-substituted-2(1H)-quinolinones and related compounds having use as cardiotonic, antihypertensive, and antithrombotic agents. 4,840,955, Cl. 514-278.000.

Sjogren, Borje, to Nordisk Kartro AB. Arrangement for profiling forwardly indexed material webs. 4,840,054, Cl. 72-382.000.

Skaliotis, Dennis A., to Theon, Inc. Astringent gel composition and method for use. 4,840,798, Cl. 424-488.000.

Skarstad, Torgeir, to Kvaerner-Eureka A/S. Vertical submersible pump assembly. 4,840,535, Cl. 415-168.200.

Skinner, Marjorie B.: *See*—
Snell, James B.; and Skinner, Marjorie B., 4,840,997, Cl. 525-210.000.

Skinner, Robert M. Game utilizing the sense of touch. 4,840,374, Cl. 273-1.00G.

Skogler, Nicholas: *See*—
Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, 4,841,458, Cl. 364-557.000.

Skrastinsh, Indulis P.: *See*—
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.

Slagg, James E. Volumetric-to-gravimetric-to-volumetric converter scale. 4,840,239, Cl. 177-25.140.

Sloane, Edwin A., to Schlumberger Technologies, Inc. System for converting analog signals to a discrete representation without aliasing. 4,841,471, Cl. 364-825.000.

SMH Alcatel: *See*—
Krasuski, Marek; Gregoire, Jean-Pierre; and Gerbaud, Claude, 4,840,696, Cl. 156-353.000.

Smiley, Robert A., to Du Pont de Nemours, E. I., and Company. Preparation of tris(2-cyanoethyl)amine. 4,841,092, Cl. 558-455.000.

Smith, Bernard: *See*—
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.

Smith, Elizabeth M.: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Smith, Roger R. Transmission shift mechanism. 4,840,091, Cl. 74-867.000.

Smith, Vernon C.: *See*—
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.

Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., to Knit-Rite, Inc. Full-fashion stump shrinker for the residual limb of a human amputee. 4,840,635, Cl. 623-36.000.

Smithkline Beckman Corporation: *See*—
Adams, Craig W.; Leary, Jeffry J.; and Rosenberg, Martin, 4,840,892, Cl. 435-5.000.

Smitweld B.V.: *See*—
Schraven, Petrus E. G.; and Jacobs, Jan A. M. H., 4,840,831, Cl. 428-152.000.

Smock, Steven W.: *See*—
Adams, George W.; Smock, Steven W.; and Helft, Ross G., 4,841,496, Cl. 368-107.000.

Snell, James B.; and Skinner, Marjorie B., to Phillips Petroleum Company. Composition and process for making gold colored olefin polymers. 4,840,997, Cl. 525-210.000.

Snyder, Andrew W., to Hoover Group, Inc. Sloped bottom tank. 4,840,284, Cl. 220-5.00A.

Sobel, Johannes: *See*—
Ohlschlager, Hans; Schranz, Karl-Wilhelm; and Sobel, Johannes, 4,840,890, Cl. 430-622.000.

Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, to Hitachi, Ltd. Rollers for rolling mills. 4,839,949, Cl. 29-132.000.

Societe a Responsabilite Limitee: *See*—
Hautemont, Jean-Claude, 4,840,555, Cl. 425-500.000.

S.A. Des Etablissements Staubli: *See*—
Bourgeaux, Pierre; and Riaud, Alain, 4,841,297, Cl. 341-11.000.

Societe Chimique des Charbonnages S.A.: *See*—
Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, 4,840,750, Cl. 260-544.00A.

Societe De Traitement Automatique - Control et Etancheite: *See*—
Cohen, Elie, 4,840,058, Cl. 73-40.000.

Societe Stein Heurtey, Z.A.I.: *See*—
Wang, Robert, 4,840,680, Cl. 134-40.000.

Sodibo S.p.A.: *See*—
Arbizzani, Tommaso, 4,840,065, Cl. 73-295.000.

Sohara, Joseph A.: *See*—
Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., 4,840,687, Cl. 149-2.000.

Solomon, Marjorie S.: *See*—
Domagala, John M.; Hagen, Susan E.; Sanchez, Joseph P.; and Solomon, Marjorie S., 4,840,956, Cl. 514-312.000.

Soltis, Richard E.: *See*—
Logothetis, Eleftherios M.; and Soltis, Richard E., 4,840,913, Cl. 436-116.000.

Solv-X Inventions Ltd.: *See*—
Lee, Edward, 4,840,223, Cl. 165-95.000.

Somar Corporation: *See*—
Kaneko, Shoji; and Nakamura, Atsumi, 4,841,558, Cl. 378-182.000.

Somemiya, Akiyoshi; and Hirobe, Kazushi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Polyethylene terephthalate resin composition. 4,840,984, Cl. 524-394.000.

Someya, Ikeo: *See*—
Ichikawa, Norihito; Someya, Ikeo; Oda, Osamu; and Amano, Toshio, 4,841,367, Cl. 358-181.000.

Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, to Toyo Soda Mfg. Co.; and Agro-Kanesho Co., Ltd. Certain-2-pyridyloxy-phenoxy-propionic acid-s-thiazolin-2-yl and benzothiazol-2-yl ester derivatives. 4,841,035, Cl. 546-270.000.

Sommer, Jean: *See*—
Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, 4,840,750, Cl. 260-544.00A.

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Meumann, Henry R.; and Stark, Johannes, 4,840,131, Cl. 110-336.000.

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Schultz, Gert, 4,840,015, Cl. 53-435.000.
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Suga, Yuko: *See—*
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Sugano, Masayo: *See—*
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Sugata, Hiroyuki: *See—*
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Sugimoto, Naoto, to Shizuoka Seiki Co., Ltd. Device for measuring moisture content in grains. 4,841,230, Cl. 324-65.00R.

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Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, to House Food Industrial Co., Ltd. Process for preparing sterilized packaged fish and product thereof. 4,840,805, Cl. 426-129.000.

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Sumitani, Hiroaki: *See—*
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Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, 4,841,027, Cl. 534-599.000.
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Sumitomo Electric Industries, Ltd.: *See—*
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Sundermeyer, Peter, to Diehl GmbH & Co. Method and arrangement for the autonomous determination of an inertial positional reference on board a guided projectile. 4,840,328, Cl. 244-3.150.
Sundstrand Corporation: *See—*
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Sung, Chiakang: *See—*
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Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Cough/cold mixtures comprising non-steroidal anti-inflammatory drugs. 4,840,962, Cl. 514-406.000.
Sunsoft Corp.: *See—*
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Suyama, Mitiyo, to Mitsubishi Denki Kabushiki Kaisha. Direction finder. 4,841,449, Cl. 364-449.000.
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Suzuki, Keiko, to Brother Kogyo Kabushiki Kaisha. Image recording and adhering apparatus. 4,841,338, Cl. 355-27.000.
Suzuki, Makoto; and Urukawa, Satoshi, to Brother Kogyo Kabushiki Kaisha. Laser beam printer with compactly arranged photosensitive element, laser beam emitting element and reflective element. 4,841,311, Cl. 346-108.000.
Suzuki, Masami: *See—*
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Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, to Uni-Charm Corporation. Nonwoven fabric patterned with apertures. 4,840,829, Cl. 428-131.000.
Suzuki, Motoyuki; Miura, Yoshio; and Fukushima, Akio, to Hitachi, Ltd. Constant linear velocity disk rotating apparatus. 4,841,511, Cl. 369-50.000.
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Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., to Dow Corning Corporation. Block copolymer matrix for transdermal drug release. 4,840,796, Cl. 424-448.000.
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Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., to G & B Rubber Stamp Co., Inc. Printer for a strip of tickets. 4,840,120, Cl. 101-228.000.
Swift, Joseph A.: *See—*
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Swix, Scott R.; and Krueger, Leroy A., to International Business Machines Corp. Interactive animation of graphics objects. 4,841,291, Cl. 340-725.000.
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Sybert, Paul D.: *See—*
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Syntex (U.S.A.) Inc.: *See—*
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Synthelabo: *See—*
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Szczesniak, Stanley J., to AM International, Inc. Master holding mechanism for duplicating machines. 4,840,121, Cl. 101-415.100.
Sze, Jerry C.: *See—*
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Sziklas, Edward A.; and Benda, John A., to United Technologies Corporation. Coupling of ring lasers. 4,841,541, Cl. 372-94.000.
Szuminski, Gary F.; and Ward, Benjamin D., to Rolls-Royce Inc. Aircraft with stowable vectorable nozzle and ejector thrust augmentation. 4,840,329, Cl. 244-12.500.

Tabata, Akihiko: *See*—
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Tabata, Hiroshi: *See*—
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Tabisz, Wojciech A.; and Lee, Fred C. Dc-to-Dc converters using multi-resonant switches. 4,841,220, Cl. 323-282.000.
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Shimada, Makoto, 4,840,430, Cl. 297-452.000.
Tacke, Peter; Grogp, Ulrich; and Idel, Karsten-Josef, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyesters. 4,841,000, Cl. 525-437.000.
Tada, Yuji: *See*—
Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, 4,840,856, Cl. 429-192.000.
Tadashima, Fumio, to Murao Boki Kabushiki Kaisha. Rove bobbin transporting system. 4,840,124, Cl. 104-163.000.
Tadokoro, Michihiro: *See*—
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.
Taga, Yutaka: *See*—
Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, 4,840,092, Cl. 74-869.000.
Tage, Yutaka: *See*—
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Taguchi, Minoru: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Taisho Pharmaceutical Co., Ltd.: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Tajika, Hiroshi: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.
Takada, Katsuhiro; and Yamanashi, Takanori, to Olympus Optical Co., Ltd. Compact zoom lens system with a high zooming ratio. 4,840,467, Cl. 350-427.000.
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, to Hitachi, Ltd. Piezoelectric actuator control apparatus. 4,841,191, Cl. 310-317.000.
Takagi, Kenichi: *See*—
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-111.810.
Takagi, Masafumi: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Programmable transfer machine. 4,841,431, Cl. 364-187.000.
Takagi, Masayuki: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Takagi, Michiyuki: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, to Pioneer Electronic Corporation. Multi-disc player. 4,841,499, Cl. 369-38.000.
Takahashi, Hideomi: *See*—
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, 4,841,538, Cl. 372-58.000.
Takahashi, Hideyuki: *See*—
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, 4,841,182, Cl. 310-68.00D.
Takahashi, Junya: *See*—
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.
Takahashi, Kohsei: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, 4,841,533, Cl. 372-45.000.
Takahashi, Kyoko: *See*—
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.
Takahashi, Minoru; and Kotani, Tsutomu, to TDK Corporation. Electrocardiograph. 4,840,183, Cl. 128-715.000.
Takahashi, Motoaki, to Fuji Photo Film Co., Ltd. Apparatus for conveying sheet member. 4,840,369, Cl. 271-276.000.
Takahashi, Mutsumi: *See*—
Terakawa, Takashige; Takahashi, Mutsumi; and akaba, Noriyuki, 4,841,308, Cl. 343-771.000.
Takahashi, Ryoichi: *See*—
Nara, Kenichi; and Takahashi, Ryoichi, 4,840,439, Cl. 312-116.000.
Takahashi, Sumio: *See*—
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.
Takahashi, Tadashi: *See*—
Yoshida, Tsukasa; Ishige, Yoshio; Matsudaira, Masaki; and Takahashi, Tadashi, 4,840,807, Cl. 426-48.000.
Takahashi, Takayuki: *See*—
Mori, Shigeru; and Takahashi, Takayuki, 4,840,739, Cl. 252-17.000.
Takahashi, Takeyoshi: *See*—
Hagiwara, Yoshiaki; Ishida, Hiromi; and Takahashi, Takeyoshi, 4,840,491, Cl. 366-69.000.
Takahashi, Tokuyuki: *See*—
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,840,263, Cl. 192-109.00F.
Takahashi, Tsutomu, to Canon Kabushiki Kaisha. Document processor. 4,841,478, Cl. 364-900.000.
Takahashi, Yasuhiro: *See*—
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.
Takahashi, Yoshihito: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Takahira, Takashi: *See*—
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, 4,841,051, Cl. 544-287.000.
Takami, Toru: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.
Takano, Toshimitsu: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, to Otsuka Kagaku Kabushiki Kaisha. Pyran derivatives. 4,840,957, Cl. 514-326.000.
Takaoka, Michio: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.
Takasaki, Terufumi: *See*—
Masuda, Eiji; Fujita, Yasuhiko; and Takasaki, Terufumi, 4,841,567, Cl. 379-355.000.
Takase, Shigeki: *See*—
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, 4,841,414, Cl. 361-424.000.
Takashima, Kohki: *See*—
Iwasaki, Tameo; and Takashima, Kohki, 4,840,951, Cl. 514-239.500.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,841,062, Cl. 548-194.000.
Takata, Yasuhira, to Sumitomo Heavy Industries, Ltd. Mobile nozzle device for die lubricating. 4,840,052, Cl. 72-45.000.
Takatori, Hiroshi: *See*—
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.
Takaya, Soichi: *See*—
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shimichiro, 4,841,439, Cl. 364-200.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Limited. New cephem and cepham compounds and processes for preparation thereof. 4,841,062, Cl. 548-194.000.
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, to Nihon Shinku Gijutsu Kabushiki Kaisha. Double-chamber ion source. 4,841,197, Cl. 315-111.810.
Take, Seiji: *See*—
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-488.000.
Takeda Chemical Industries, Ltd.: *See*—
Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, 4,841,008, Cl. 528-45.000.
Takeda, Hiroshi: *See*—
Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, 4,841,545, Cl. 375-1.000.
Takeda, Kiyoshi: *See*—
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Takeda, Shigeki: *See*—
Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, 4,841,545, Cl. 375-1.000.
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, to Mitsubishi Denki Kabushiki Kaisha. Low pressure mercury vapor discharge lamp and preparation thereof. 4,840,593, Cl. 445-26.000.
Takegahara, Takashi: *See*—
Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, 4,841,432, Cl. 364-191.000.
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, to Coca-Cola Company, The. Process for producing bottled beverages. 4,840,014, Cl. 53-432.000.

Takei, Tetsuya, to Canon Kabushiki Kaisha. Apparatus for the formation of a functional deposited film using microwave plasma chemical vapor deposition process. 4,840,139, Cl. 118-723.000.

Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, to Fuji Photo Film Co., Ltd. Developing device for photosensitive material. 4,841,320, Cl. 354-299.000.

Takemoto, Iwao: *See*—
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou, 4,841,369, Cl. 358-213.260.

Takeuchi, Kazuhiro: *See*—
Sakane, Takaaki; and Takeuchi, Kazuhiro, 4,840,541, Cl. 416-223.00R.

Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, to Sanyo Electric Co., Ltd. Electrostatic recording apparatus. 4,841,328, Cl. 355-211.000.

Takeuchi, Tsutomu: *See*—
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.

Takeura, Tooru: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Takigawa, Kazunori; and Suzuki, Roichi, to Usui Kokusai Sangyo Kabushiki Kaisha. Valve actuator for slide exhaust brake systems. 4,840,348, Cl. 251-63.600.

Takigawa, Masuo: *See*—
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.

Takiguchi, Haruhisa: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.

Takimoto, Hiroshi: *See*—
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Takimoto, Masaaki, to Fuji Photo Film Co., Ltd. Process for displaying information. 4,841,293, Cl. 340-763.000.

Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Dialkanoyloxybenzylidene dialkanoate. 4,841,097, Cl. 560-144.000.

Takizawa, Kazuyoshi; and Watanuki, Kiyoshi, to Hitachi, Ltd. Display device including flyback transformer constructed to control leakage currents. 4,841,201, Cl. 315-411.000.

Tam Ceramics Inc.: *See*—
Campbell, John S.; Baker, Brian N.; and Katyal, Anil, 4,840,774, Cl. 423-79.000.

Tamai, Hideki, to NEC Corporation. Magnetic recording medium having perpendicular magnetic anisotropy. 4,840,845, Cl. 428-336.000.

Tamaki, Sigeo: *See*—
Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizawa, Isamu, 4,840,146, Cl. 123-52.0MB.

Tamano, Satoshi: *See*—
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, 4,840,180, Cl. 128-661.080.

Tamaru, Sinji; and Kubo, Motonobu, to Daikin Industries, Ltd. Tricyclodecane derivative. 4,841,005, Cl. 526-245.000.

Tamaru, Sinji; and Kubo, Motonobu, to Daikin Industries, Ltd. Aromatic dicarboxylic acid diallyl ester derivative, prepolymer derived from the derivative and curable resin composition containing the derivative. 4,841,093, Cl. 560-65.000.

Tamura Electric Works, Ltd.: *See*—
Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, 4,841,563, Cl. 379-150.000.

Tamura, Hifumi; Shichi, Hiroyasu; and Umemura, Kaoru, to Hitachi, Ltd. Charged particle beam apparatus. 4,841,143, Cl. 250-288.000.

Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, to Mitsubishi Kasei Corporation. Aromatic polyester/aromatic polycarbonate/alpha-olefin unsaturated carboxylic acid reaction product compositions. 4,840,995, Cl. 525-133.000.

Tanabe, Hideo: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Iwasaki, Tameo; and Takashima, Kohki, 4,840,951, Cl. 514-239.500.

Tanabe, Yoo: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,971, Cl. 514-721.000.

Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, to Toyota Jidosha Kabushiki Kaisha. Combustion chamber of a two-stroke engine. 4,840,147, Cl. 123-65.0VD.

Tanaka, Kazuya: *See*—
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.

Tanaka, Koichi: *See*—
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, 4,841,081, Cl. 549-541.000.

Tanaka, Makoto: *See*—
Kitagawa, Masayuki; and Tanaka, Makoto, 4,841,076, Cl. 549-401.000.

Tanaka, Masahiro: *See*—
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, 4,840,104, Cl. 84-437.000.

Tanaka, Motoaki: *See*—
Watanabe, Yoshikazu; and Tanaka, Motoaki, 4,840,881, Cl. 430-512.000.

Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Heat transfer medium. 4,840,837, Cl. 428-216.000.

Tanaka, Norihiko: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.

Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, to Teijin Limited. Process for producing 16-substituted prostaglandin es. 4,841,091, Cl. 558-441.000.

Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Focusing method for zoom lens. 4,840,468, Cl. 350-427.000.

Tanaka, Tsuyoshi: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Tandler, Peter; and Cezanne, Rudolf, to Alfred Teves GmbH. Device for indicating the filling level in a fluid reservoir. 4,841,107, Cl. 200-84.00C.

Tanemura, Yasunari: *See*—
Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, 4,840,116, Cl. 98-115.200.

Taneya, Shoichi: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.

Tani, Hiroji: *See*—
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.

Taniguchi, Isao, to Fuji Photo Film Co., Ltd. Image forming method. 4,841,339, Cl. 355-27.000.

Taniguchi, Masato: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.

Taniguchi, Nobuyuki: *See*—
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.

Taniguchi, Tadao: *See*—
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, 4,840,296, Cl. 222-600.000.

Taniguchi, Yoshiteru: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.

Tanimura, Nobuyoshi: *See*—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.

Tanji, Masayuki: *See*—
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, 4,841,439, Cl. 364-200.000.

Taper-Lok Corporation: *See*—
Welkey, Joseph J., 4,840,409, Cl. 285-167.000.

Tardos, Laszlo : *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Tarnow, Horst; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. N-substituted benzamides. 4,840,969, Cl. 514-617.000.

Tarr, Richard D.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.

Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, to Opticon Inc. Pattern recognition device. 4,841,129, Cl. 235-472.000.

Taylor-Winfield Corporation, The: *See*—
Green, Edward A.; and Stambaugh, Clayton S., 4,841,121, Cl. 249-243.000.

TDK Corporation: *See*—
Takahashi, Minoru; and Kotani, Tsutomu, 4,840,183, Cl. 128-715.000.
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.

Teac Corporation: *See*—
Yamaguchi, Hirohisa; and Mashimo, Akira, 4,841,504, Cl. 369-32.000.

Technologies Speciales Ingenierie-T.S.I.: *See*—
Martin, Andre ; and Luong, Minh P., 4,841,149, Cl. 250-330.000.

Tecno S.p.A. Mobili e Forniture per Arredamento: *See*—
Borsani, Paolo, 4,840,023, Cl. 59-78.100.

Tecumseh Products Company: *See*—
Fry, Emanuel D., 4,840,547, Cl. 417-422.000.

Teijin Ltd.: *See—*
Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,841,091, Cl. 558-441.000.
Teknekron Infoswitch Corporation: *See—*
Mann, James A., Jr.; and Haselton, E. Fletcher, 4,840,570, Cl. 439-74.000.
Tektronix, Inc.: *See—*
Bateman, Glenn; and Brand, Donald L., 4,841,497, Cl. 368-113.000.
Cleary, Edward J., Jr.; Coleman, Mike R.; and Jones, Michael R., 4,841,200, Cl. 315-363.000.
Telefunken Fernseh und Rundfunk GmbH: *See—*
Vuong, The A., 4,841,465, Cl. 364-725.000.
Tellier, Jean-Pierre: *See—*
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, 4,841,106, Cl. 200-462.000.
Tempaku, Junya: *See—*
Murakami, Joji; Sibazaki, Syogo; and Tempaku, Junya, 4,841,298, Cl. 341-51.000.
Teng, James: *See—*
Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, 4,841,457, Cl. 364-557.000.
Terada, Hiroaki: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Terakawa, Takashige; Takahashi, Mutsumi; and akaba, Noriyuki, to Tokyo Keiki Co., Ltd. Slotted waveguide antenna assembly. 4,841,308, Cl. 343-771.000.
Teramae, Tomohiro: *See—*
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.
Terashima, Hideyuki; and Tsuchiya, Yasuhiko, to Nissin Kogyo Kabushiki Kaisha. Lever system for vehicles. 4,840,082, Cl. 74-523.000.
Teresi, Gaspare. Traction mat. 4,840,309, Cl. 238-14.000.
Terpolilli, Anthony J.: *See—*
Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., 4,840,898, Cl. 435-87.000.
Terumo Corporation: *See—*
Kobayashi, Susumu; and Satoh, Kazumasa, 4,840,620, Cl. 604-246.000.
Yamaguchi, Keiji, 4,840,181, Cl. 128-680.000.
Testa, Sandro, to Campagnolo S.p.A. Rear derailer for bicycle gears. 4,840,605, Cl. 474-80.000.
Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., to Getech A/S. Piezoelectric hydrophone. 4,841,192, Cl. 310-337.000.
Tetra Pak Finance & Trading S.A.: *See—*
Drevfors, Gunnar; Cornlea, Donald G.; and Paulson, Norman J., 4,840,205, Cl. 141-2.000.
Texas Alkyls, Inc.: *See—*
Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., 4,841,082, Cl. 556-129.000.
Texsa, S.A.: *See—*
Codina, Francisco C., 4,840,839, Cl. 428-240.000.
Tezuka, Hidenori: *See—*
Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, 4,840,608, Cl. 474-205.000.
Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, to Kyocera Corporation. Self-illuminant delineator and delineator system by use thereof. 4,841,278, Cl. 340-908.100.
Tezuka, Yasuo: *See—*
Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, 4,841,027, Cl. 534-599.000.
Kayane, Yutaka; Otake, Katsumasa; and Tezuka, Yasuo, 4,841,031, Cl. 534-638.000.
Thayer Coggin Incorporated: *See—*
Coggin, J. Thayer; and Hilton, Robert R., 4,839,938, Cl. 16-45.000.
Theil, Michael H.: *See—*
Cuculo, John A.; Theil, Michael H.; Yang, Kap S.; and Chen, Yue S., 4,840,673, Cl. 106-198.000.
Theon, Inc.: *See—*
Skaliotis, Dennis A., 4,840,798, Cl. 424-488.000.
Therapeutic Systems, Inc.: *See—*
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., 4,840,591, Cl. 441-106.000.
Therm-O-Disc, Incorporated: *See—*
Horton, Paul J., 4,841,273, Cl. 338-28.000.
Yagher, Charles, Jr.; and Day, Kenneth C., 4,841,274, Cl. 338-28.000.
Thiele, Peter: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Thiennot, Jean, to Etat Francais Represente Par Le Ministre des Postes et Telecommunications-Centre National D'Etudes des Telecommunications. Optical fiber transmission apparatus, in particular for submarine use. 4,840,448, Cl. 350-96.160.
Thoma, Helmut: *See—*
Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, 4,841,554, Cl. 378-57.000.
Thoman, Richard A., Jr., to Greene, Tweed & Co. Split sealing ring having a bias cut. 4,840,379, Cl. 277-222.000.
Thomas Industries Inc.: *See—*
Betts, John E.; and Toledo, George, 4,839,988, Cl. 49-141.000.
Thomas Jefferson University: *See—*
Osterholm, Jewell L., 4,840,617, Cl. 604-174.000.
Thomas, Sherman G., to General Electric Company. Keying apparatus for connecting a printed wiring assembly to a backplane structure. 4,840,586, Cl. 439-680.000.
Thomas, Teresa M.: *See—*
Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.
Thomey, Henry W.: *See—*
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., 4,840,607, Cl. 474-167.000.
Thoraval, Maurice: *See—*
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,840,221, Cl. 165-41.000.
Thorsrud, Agmund K., to Phillips Petroleum Company. Methods of preparing molded thermoplastic articles wherein radio frequency energy is utilized to heat the thermoplastic material. 4,840,758, Cl. 264-26.000.
Thrush, Roger L.: *See—*
Goodman, Joseph R.; and Thrush, Roger L., 4,841,105, Cl. 200-16.00D.
Tiba, Omar: *See—*
Culbertson, Billy M.; and Tiba, Omar, 4,841,002, Cl. 525-504.000.
Tieke, Bernd; and Zahir, Sheik A., to Ciba-Geigy Corporation. Dehydrogenated polyspiroheptadiene. 4,840,999, Cl. 525-332.100.
Tiemann, Wilhelm: *See—*
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.
TIGG Corporation: *See—*
Tiggelbeck, Donald D., 4,840,651, Cl. 55-479.000.
Tiggelbeck, Donald D., to TIGG Corporation. Gas/solids contacting device. 4,840,651, Cl. 55-479.000.
Ting, Raymond M. L. Externally drained wall joint design. 4,840,004, Cl. 52-235.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, 4,840,778, Cl. 423-324.000.
Tobe, Hayato: *See—*
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, to Osaka Soda Co., Ltd. Method of optically resolving a racemate or a diastereomeric mixture of glycidyl compound. 4,841,081, Cl. 549-541.000.
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., to Dana-Farber Cancer Institute; and University of Michigan, The. Method of reducing tissue damage at an inflammatory site using a monoclonal antibody. 4,840,793, Cl. 424-85.800.
Togawa, Eisei: *See—*
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Toguchi, Akira, to Sanyo Electric Co., Ltd. Still reproduction controlling circuit. 4,841,381, Cl. 360-10.300.
Tohpren, Co., Ltd.: *See—*
Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, 4,841,022, Cl. 528-487.000.
Toko Kabushiki Kaisha: *See—*
Oshikawa, Michitaka, 4,841,264, Cl. 333-189.000.
Tokuda, Kanji, to Fuji Photo Film Co., Ltd. Method of an apparatus for producing additional print. 4,841,340, Cl. 355-38.000.
Tokunaga, Masami: *See—*
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.
Tokyo Automatic Machinery Works Ltd.: *See—*
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.
Tokyo Keiki Co., Ltd.: *See—*
Terakawa, Takashige; Takahashi, Mutsumi; and akaba, Noriyuki, 4,841,308, Cl. 343-771.000.
Toledo, George: *See—*
Betts, John E.; and Toledo, George, 4,839,988, Cl. 49-141.000.
Tomagou, Satoshi: *See—*
Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, 4,840,986, Cl. 524-436.000.
Tomaka, Jan Z., to Alcan International Limited. Top chord for open top hopper cars. 4,840,127, Cl. 105-406.100.
Tomasek, Jaroslav, to FMC Corporation. Current and torque feedback system and circuitry for sine-wave controlled brushless servo drive systems. 4,841,213, Cl. 318-661.000.
Tomida, Yoshinori: *See—*
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.
Tomikawa, Arifumi; and Yasukawa, Nihiko, to Oki Electric Industry Co., Ltd. Brief case with a portable wireless telephone. 4,840,258, Cl. 190-102.000.
Tominaga, Ryuichiro: *See—*
Muramatsu, Mitsuru; and Tominaga, Ryuichiro, 4,840,011, Cl. 53-381.00R.

Tominaga, Shinji: *See—*
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Tominaga, Yasunori, to Live International Co., Ltd. Method of adjusting the qualtity of liquors. 4,840,812, Cl. 426-488.000.
Tomita, Hirofumi: *See—*
Oda, Masatsugu; Sasaki, Naoko; Sakaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.
Tomita, Naotaka: *See—*
Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, 4,840,251, Cl. 181-205.000.
Tomizawa, Takeshi: *See—*
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.
Tomizawa, Youzi; and Mizutani, Masashi, to Alps Electric Co., Ltd. Cover mechanism for a recording medium holding device. 4,841,394, Cl. 360-99.060.
Tomoda, Toshimasa: *See—*
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.
Tonon, Giancarlo: *See—*
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.
Topfer, Claus: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Toray Silicone Co., Ltd.: *See—*
Suzuki, Toshio; and Okawa, Tadashi, 4,840,693, Cl. 156-329.000.
Torii, Michihiro: *See—*
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Toro Company, The: *See—*
Tyler, Stephen L., 4,840,312, Cl. 239-205.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Itoh, Hiroshi, 4,841,208, Cl. 318-561.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.
Toshiba Silicone Co., Ltd.: *See—*
Kobayashi, Keiji; and Urabe, Takashi, 4,841,006, Cl. 528-15.000.
Tosoh Corporation: *See—*
Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, 4,840,849, Cl. 428-419.000.
Tosoh Corporation and Toso Susteel Co., Ltd.: *See—*
Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, 4,840,986, Cl. 524-436.000.
Totsu, Hideo: *See—*
Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, 4,841,563, Cl. 379-150.000.
Totty, Jerry. Automobile lift and tow hoist. 4,840,534, Cl. 414-563.000.
Towle, Ian D. H., to Raychem Limited. Preparation of arylene oligomers. 4,841,011, Cl. 528-125.000.
Towle, Ian D. H., to Raychem Limited. Preparation of poly(arylene ether ketones). 4,841,013, Cl. 528-125.000.
Towle, Ian D. H., to Raychem Limited. Preparation of monomers. 4,841,094, Cl. 560-73.000.
Townsend, Herbert E.: *See—*
Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, 4,840,712, Cl. 204-28.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Shirasaki, Yoshikazu; and Inuzuka, Kenichi, 4,840,826, Cl. 428-36.910.
Toyo Seikan Kaisha Ltd.: *See—*
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.
Toyo Soda Mfg. Co.: *See—*
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.
Toyo Tire & Rubber Co., Ltd.: *See—*
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, 4,840,988, Cl. 524-476.000.
Toyoda Gosei Co., Ltd.: *See—*
Nishiki, Hiroyuki; and Kokuryu, Yuji, 4,840,408, Cl. 285-62.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Toyoda, Yoshiharu; Mikata, Yoshitaka; and Yamano, Shoji, to Yamato Scale Company, Limited. Weighing and packing device. 4,840,240, Cl. 177-25.180.
Toyota, Akinori: *See—*
Kashiwa, Norio; Toyota, Akinori; and Kioka, Mamoru, 4,841,003, Cl. 526-125.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Fujita, Hiroya, 4,840,149, Cl. 123-90.310.
Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, 4,841,447, Cl. 364-431.070.
Izumi, Akira; Kishi, Tomomi; and Niwa, Hideo, 4,840,417, Cl. 294-65.500.
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,840,263, Cl. 192-109.00F.
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,840,544, Cl. 417-254.000.
Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, 4,840,116, Cl. 98-115.200.
Okumura, Atsuo, 4,840,027, Cl. 60-274.000.
Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, 4,840,092, Cl. 74-869.000.
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Trading Post Restaurants Limited: *See—*
McFarlane, Robert; and Walker, Stewart M., 4,840,128, Cl. 108-50.000.
Tran, Nam H.: *See—*
Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., 4,841,082, Cl. 556-129.000.
Transpower A/S: *See—*
Hansen, Ove, 4,841,270, Cl. 336-61.000.
Trenkle, Robert W.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.
Tri-tech, Inc.: *See—*
Cooper, Roy; and Hansen, Charles, 4,841,189, Cl. 310-257.000.
TriTech Laboratories, Inc.: *See—*
Curtis, Guy T., 4,841,559, Cl. 379-27.000.
Trube, Hans-Wilhelm: *See—*
Freitag, Elmar; Weller, Karl-Heinz; and Trube, Hans-Wilhelm, 4,840,113, Cl. 98-2.000.
Truth Incorporated: *See—*
Tucker, Daniel G., 4,840,075, Cl. 74-89.140.
Trutzschler GmbH & Co. KG: *See—*
Leifeld, Ferdinand, 4,839,943, Cl. 19-80.00R.
TRW United-Carr Ltd.: *See—*
Neil, Gary A.; and Ferguson, Edward H. F., 4,840,345, Cl. 248-74.200.
TRW Vehicle Safety Systems Inc.: *See—*
Higbee, Wallace C.; and Bauer, Barney J., 4,840,324, Cl. 242-107.600.
Tsay, Hwa-Yang. Multi-function satchel. 4,840,441, Cl. 312-231.000.
Tsentralnoe Proektno-Konstruktorskoe Bjuro Vsesojuznogo Rybopromyshlennogo Obiedinenia Azovo-Chernomorskogo Bassejna: *See—*
Raikov, Nikolai N., 4,840,134, Cl. 112-162.000.
Tsironis, Christos, to U.S. Philips Corporation. Dual-gate fet amplifier-mixer with intermediate ohmic island for rejecting a frequency band. 4,841,169, Cl. 307-303.000.
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, to Hitachi, Ltd. Optical recording method and apparatus using two fight spots. 4,841,514, Cl. 369-100.000.
Tsubouchi, Toshiyuki; Abe, Kazuaki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. Fluid composition. 4,840,745, Cl. 252-73.000.
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, to Mitsuba Electric Mfg., Co., Ltd. Rectifier in alternating generators for automotive vehicles. 4,841,182, Cl. 310-68.00D.
Tsuchiya, Yasuhiko: *See—*
Terashima, Hideyuki; and Tsuchiya, Yasuhiko, 4,840,082, Cl. 74-523.000.
Tsuchiya, Yutaka: *See—*
Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,841,234, Cl. 324-96.000.
Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,841,062, Cl. 548-194.000.
Tsuji, Kunio: *See—*
Nakamura, Shozo; Mathusima, Tokunori; and Tsuji, Kunio, 4,840,766, Cl. 376-378.000.
Tsuji, Masaru, to Sharp Kabushiki Kaisha. Paper conveying roller for image forming apparatus. 4,840,300, Cl. 226-187.000.
Tsuji, Michiru; Konno, Chisato; and Saji, Miyuki, to Hitachi, Ltd. Method for preparing a simulation program. 4,841,479, Cl. 364-900.000.
Tsuji, Shinji: *See—*
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.
Tsujii, Gen: *See—*
Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.
Tsujimoto, Kazumi: *See—*
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.
Tsujimura, Kazuya: *See—*
Kasai, Naoya; Shima, Hisaharu; and Tsujimura, Kazuya, 4,840,907, Cl. 435-253.300.
Tsukada, Masamichi: *See—*
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.

Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, to Takeda Chemical Industries, Ltd. Coating compositions. 4,841,008, Cl. 528-45.000.
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Lid spring locking structure in a magnetic tape cassette. 4,841,403, Cl. 360-132.000.
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Novel ether compound, a process for manufacturing the same, a composition containing the same and a use thereof. 4,840,971, Cl. 514-721.000.
Tucker, Daniel G., to Truth Incorporated. Window operator. 4,840,075, Cl. 74-89.140.
Tuftco Corporation: *See—*
Watkins, Charles W., 4,840,133, Cl. 112-80.300.
Tuneki, Hideaki: *See—*
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.
Tunker, Gerhard: *See—*
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.
Tush Cush, Inc.: *See—*
Noble, Roger H., 4,840,425, Cl. 297-284.000.
Twerdochlib, Michael, to Westinghouse Electric Corp. Fail safe valve for an air inleakage monitoring system in a steam turbine. 4,840,063, Cl. 73-203.000.
TX Controls AB: *See—*
Nilsson, Ingmar, 4,840,079, Cl. 74-500.500.
Tyler, Stephen L., to Toro Company, The. Sprinkler nozzle module. 4,840,312, Cl. 239-205.000.
UBE Industries, Ltd.: *See—*
Ishimoto, Kenji; and Kawabata, Kouji, 4,840,557, Cl. 425-555.000.
Uchida, Minoru: *See—*
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Uchiyama, Hiromi; and Nakano, Tsuyoshi, to Izumi Seimitsu Kogyo Kabushiki Kaisha. Fixing structure of blade force up spring for clothes shaver and electric shaver. 4,839,964, Cl. 30-43.600.
Udren, Eric A., to Westinghouse Electric Corp. Protective relaying apparatus for providing fault-resistance correction. 4,841,405, Cl. 361-80.000.
Ueda, Hiroshi: *See—*
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Ueda, Michio; and Shibata, Satoshi, to Brother Kogyo Kabushiki Kaisha. Control device for a stepping motor. 4,841,214, Cl. 318-696.000.
Uehara, Kazuhiro, to Laurel Bank Machines Co., Ltd. Bill containing box apparatus of bill receiving and dispensing machine. 4,840,368, Cl. 271-162.000.
Ueki, Kazuyeshi: *See—*
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.
Uematsu, Tamon: *See—*
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.
Ueno, Masaji; and Masuoka, Hideaki, to Kabushiki Kaisha Toshiba. Bipolar-MOS logic circuit with high speed operation. 4,841,172, Cl. 307-443.000.
Ueno, Ryuji: *See—*
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, 4,840,941, Cl. 514-59.000.
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Method for inhibiting infection of human T-cells. 4,840,941, Cl. 514-59.000.
Uesawa, Yutaka; and Morimoto, Isamu, to Konishiroku Photo Industry Co., Ltd. High whiteness silver halide photographic paper for direct positives. 4,840,889, Cl. 430-597.000.
Ueshima, Michio: *See—*
Hino, Youichi; Shimasaki, Yuuji; and Ueshima, Michio, 4,841,060, Cl. 546-184.000.
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.
Ueyama, Seiji; and Onoe, Hiroyasu, to General Company Limited. Heat-sensitive transferring recording medium. 4,840,835, Cl. 428-212.000.
Ullrich, Georg J., to Hellige GmbH. Combined sensor for the transcutaneous measurement of oxygen and carbon dioxide in the blood. 4,840,179, Cl. 128-633.000.
Umemura, Kaoru: *See—*
Tamura, Hifumi; Shichi, Hiroyasu; and Umemura, Kaoru, 4,841,143, Cl. 250-288.000.
Umemura, Shin'ichiro: *See—*
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.
Umeyama, Hideaki: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.
Umezawa, Mitsuo: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.
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Uni-Cardan AG: *See—*
Herrmann, Gert, 4,840,262, Cl. 192-106.200.
Uni-Charm Corporation: *See—*
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.
Unimax Distribution Limited: *See—*
Ming, Alex L. K., 4,840,599, Cl. 446-465.000.
Union Carbide Corporation: *See—*
Koleske, Joseph V.; and Kwiatkowski, George T., 4,840,978, Cl. 522-169.000.
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.
Unistrut International Corp.: *See—*
Rebentisch, Hugo E., 4,840,525, Cl. 411-85.000.
Unisys Corporation: *See—*
Angelucci, Ernest A., 4,841,231, Cl. 324-73.00R.
Chenest, Gerard, 4,840,507, Cl. 400-713.000.
Kingston, Samuel C., 4,841,552, Cl. 377-43.000.
Morrison, Larry R.; and Jenkins, Vaughn J., 4,841,257, Cl. 331-26.000.
United Foam Plastics Corporation: *See—*
Waldner, Charles, 4,840,277, Cl. 206-523.000.
United States of America
Air Force: *See—*
Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., 4,840,026, Cl. 60-271.000.
Walter, Martin J., 4,841,150, Cl. 250-339.000.
Army: *See—*
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.
Epstein, Joseph; Parsons, John A.; and Block, Frank, 4,840,911, Cl. 436-8.000.
Jasper, Louis J., Jr., 4,840,106, Cl. 89-8.000.
Energy: *See—*
Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., 4,840,816, Cl. 427-38.000.
Cooper, James A., 4,841,570, Cl. 380-30.000.
Doherty, Joseph P.; and Marek, James C., 4,840,765, Cl. 376-310.000.
George, Michael; Pierson, Lyndon G.; and Wilkins, Mark E., 4,841,550, Cl. 375-118.000.
Miller, Steven S., 4,840,931, Cl. 502-162.000.
Richlen, Scott L., 4,840,226, Cl. 165-134.100.
Woodward, Jonathan, 4,840,904, Cl. 435-165.000.
Wu, Jung Fu, 4,840,903, Cl. 435-165.000.
Interior: *See—*
Futrell, James C., II, 4,840,062, Cl. 73-170.00A.
National Aeronautics and Space Administration: *See—*
Bickler, Donald B., 4,840,394, Cl. 280-677.000.
Elleman, Daniel D.; Allen, James L.; and Lee, Mark C., 4,840,496, Cl. 374-124.000.
U.S. Philips Corporation: *See—*
De With, Gijsbertus; and Van Dijk, Hendricus J. A., 4,841,195, Cl. 313-636.000.
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.
Farhangi, Hassan; and Konings, Johan W. M. E., 4,841,513, Cl. 369-59.000.
Guenot, Andre; and Cantou, Christian J. R., 4,841,365, Cl. 358-147.000.
Hartmann, Wilbert J. A. M., 4,840,462, Cl. 350-350.00S.
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.
Loy, Fernand R.; Perrin, Jean-Claude; and Rollin, Joel, 4,840,465, Cl. 350-421.000.
Maijers, Andries C.; Weekamp, Johannus W.; Van Den Ackerveken, Antonius C. J. C.; and Brink, Jan, 4,841,410, Cl. 361-306.000.
Schoofs, Franciscus A. C. M., 4,841,564, Cl. 379-413.000.
Tsironis, Christos, 4,841,169, Cl. 307-303.000.
Vermeer, Adrianus J. P. M., 4,839,961, Cl. 29-740.000.
Zandveld, Frederik; and Van Der Vliet, Peter C. L., 4,841,474, Cl. 364-900.000.
United Technologies Corporation: *See—*
Lomangino, Michael, 4,841,262, Cl. 333-81.00R.
Poumakis, Demetrius J., 4,841,209, Cl. 318-564.000.
Sziklas, Edward A.; and Benda, John A., 4,841,541, Cl. 372-94.000.
Universal Instruments Corporation: *See—*
Zemek, Albert W., 4,840,268, Cl. 198-817.000.
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Landre, Bernard, 4,841,237, Cl. 324-127.000.
Universite Paul Sabatier (Toulouse III): *See—*
Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, 4,840,925, Cl. 501-1.000.
University of Chicago: *See—*
Doi, Kunio; and Kume, Yuichiro, 4,841,555, Cl. 378-99.000.
University of Cincinnati: *See—*
Gluckman, Jack L., 4,840,174, Cl. 128-303.100.
University of Georgia Research Foundation, Inc.: *See—*
Chu, Chung K.; and Schinazi, Raymond F., 4,841,039, Cl. 536-29.000.
University of Illinois, The Board of Trustees of The: *See—*
Lyding, Joseph W., 4,841,148, Cl. 250-306.000.

University of Michigan, The: *See*—
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

University of North Carolina at Chapel Hill: *See*—
DiBianca, Frank A., 4,841,152, Cl. 250-374.000.

University of Texas System, The: *See*—
Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., 4,841,217, Cl. 322-8.000.

University of Vermont & State Agricultural College: *See*—
Kuehne, Martin, 4,841,045, Cl. 540-478.000.

University of Virginia Alumni Patents Foundation, The: *See*—
Brubaker, Clifford E.; and McLaurin, Colin A., 4,840,076, Cl. 74-143.000.

Unland, Georg; and Driemeier, Gunter, to Krupp Polysius AG. Apparatus for the heat treatment of fine-grained material. 4,840,561, Cl. 432-106.000.

UOP: *See*—
Cannan, Thomas R., 4,840,779, Cl. 423-328.000.
Faucher, Joseph A., 4,840,777, Cl. 423-229.000.
Johnson, Russell W.; and Hilfman, Lee, 4,840,722, Cl. 208-95.000.
Kaines, Tom N.; and James, Robert B., Jr., 4,840,721, Cl. 208-57.000.

Urabe, Hitoshi; Shigaki, Takao; and Shimazaki, Osamu, to Fuji Photo Film Co., Ltd. Apparatus for generating positive or negative image output signals from either positive or negative originals. 4,841,362, Cl. 358-80.000.

Urabe, Takashi: *See*—
Kobayashi, Keiji; and Urabe, Takashi, 4,841,006, Cl. 528-15.000.

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Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.

Urban, Frank J., to Pfizer, Inc. Process for the production of asymmetric hydantoins. 4,841,079, Cl. 549-404.000.

Urukawa, Satoshi: *See*—
Suzuki, Makoto; and Urukawa, Satoshi, 4,841,311, Cl. 346-108.000.

Usami, Toshimasa; Hatakeyama, Seiji; and Shimomura, Akihiro, to Fuji Photo Film Co., Ltd. Heat sensitive recording material. 4,840,933, Cl. 503-213.000.

Ushida, Masahiko; and Shibata, Hitoshi, to Nippondenso Co., Ltd. Indicator arrangement for motor vehicles. 4,841,155, Cl. 250-463.100.

Ushio Denki: *See*—
Arai, Tetsuji, 4,840,876, Cl. 430-328.000.
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.

Usuda, Kinya: *See*—
Shigemitsu, Fumiaki; Usuda, Kinya; and Nomaki, Tatsuo, 4,840,874, Cl. 430-296.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See*—
Takigawa, Kazunori; and Suzuki, Roichi, 4,840,348, Cl. 251-63.600.

Utagawa, Ken: *See*—
Hoshino, Kunihisa, deceased; Hamanishi, Yoshinari; and Utagawa, Ken, 4,841,325, Cl. 354-402.000.

Utex Industries, Inc.: *See*—
Pippert, Aaron J., 4,839,983, Cl. 43-42.060.

Utsui, Masaaki: *See*—
Chikamasa, Hiroshi; Utsui, Masaaki; and Nojiri, Yasutami, 4,840,818, Cl. 427-130.000.

Uvdal, Jonas P.: *See*—
Appelgren, Curt H.; Eskilsson, Eva C.; and Uvdal, Jonas P., 4,840,799, Cl. 424-493.000.

Vac Tec, Inc.: *See*—
Weekley, David L.; and Parker, Ivan, 4,840,297, Cl. 222-607.000.

Vagnozzi, Barbara A.: *See*—
Hakim, Shafik J.; Locher, Mark R.; Nieng, Kenneth Y.; and Vagnozzi, Barbara A., 4,841,433, Cl. 364-200.000.

Vaida, Robert M.: *See*—
Osthus, Harold L.; de Raismes, John F.; Wolfson, Lawrence S.; and Vaida, Robert M., 4,840,123, Cl. 104-100.000.

Valyocsik, Ernest W., to Mobil Oil Corporation. ZSM-51, method of preparing same and catalytic conversion therewith. 4,840,780, Cl. 423-329.000.

Van Beveren, Shirley M.; and Pappenhagen, Albert R., to Miles Laboratories, Inc. Virally inactivated, non-toxic, human transferrin preparation. 4,841,026, Cl. 530-394.000.

van Blerkom, Jonathan, to Genetic Engineering, Inc. Encapsulation of sperm for artificial insemination. 4,840,891, Cl. 435-2.000.

van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, to Akzo N.V.; and Sanofi S.A. Pentasaccharides and tetrasaccharides having anti-thrombotic activity. 4,841,041, Cl. 536-118.000.

Van Dedem, Gijsbert W. K.; and Van Houdenhoven, Francois E. A., to Akzo N.V. Modified human insulin and its use as starting material for the preparation of human insulin. 4,840,897, Cl. 435-69.000.

Van Den Ackerveken, Antonius C. J. C.: *See*—
Maijers, Andries C.; Weekamp, Johannus W.; Van Den Ackerveken, Antonius C. J. C.; and Brink, Jan, 4,841,410, Cl. 361-306.000.

Van Der Mark, Johannes M.: *See*—
Van Iperen, Roeland; Van Der Mark, Johannes M.; and Kooijmans, Petrus G., 4,840,979, Cl. 523-404.000.

van der Schaaf, Herman J., to B. V. Gerbs. ter Braak. Pipe coil cooker. 4,840,678, Cl. 127-2.000.

Van Der Vliet, Peter C. L.: *See*—
Zandveld, Frederik; and Van Der Vliet, Peter C. L., 4,841,474, Cl. 364-900.000.

Van Dijk, Hendricus J. A.: *See*—
De With, Gijsbertus; and Van Dijk, Hendricus J. A., 4,841,195, Cl. 313-636.000.

Van Erden, Donald L.; and Ausnit, Steven, to Minigrip, Inc. Gusseted bags with reclosure features. 4,840,611, Cl. 493-213.000.

van Heteren, Jan: *See*—
Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., 4,840,810, Cl. 426-312.000.

Van Houdenhoven, Francois E. A.: *See*—
Van Dedem, Gijsbert W. K.; and Van Houdenhoven, Francois E. A., 4,840,897, Cl. 435-69.000.

Van Iperen, Roeland; Van Der Mark, Johannes M.; and Kooijmans, Petrus G., to Shell Oil Company. Process for preparing cationic coating compositions using ammonia adducts of epoxy resins which are further reacted with a cyclic anhydride. 4,840,979, Cl. 523-404.000.

Vannier, Jean, to Clextral. Method for mounting and removing screws of an extrusion machine. 4,839,955, Cl. 29-402.080.

Varga, John T.: *See*—
Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., 4,841,453, Cl. 364-519.000.

Vargai, Zoltan: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Varner, James R.: *See*—
Prilik, Ronald J.; and Varner, James R., 4,841,485, Cl. 365-201.000.

Varta Batterie Aktiengesellschaft: *See*—
Nijnawan, Subash-Chander; Daniel, Horst; and Dennstedt, Welf, 4,840,857, Cl. 429-197.000.

Vaughan Co., Inc.: *See*—
Dorsch, Glenn R., 4,840,384, Cl. 277-12.000.

VDO Adolf Schindling AG: *See*—
Rumpf, Bernd; and Reisch, Wolfgang, 4,841,451, Cl. 364-484.000.

VEB Forschung und Entwicklung: *See*—
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.

Velcro Industries B.V.: *See*—
Grogan, Larry N., 4,840,339, Cl. 248-205.200.

Venuti, Michael C.: *See*—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,840,965, Cl. 514-450.000.

Verbos, Stephen P., to Lift Tech International Inc. D.C. solenoid control circuit. 4,841,215, Cl. 318-757.000.

Vermaas, Leo F.: *See*—
Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., 4,840,810, Cl. 426-312.000.

Vermeer, Adrianus J. P. M., to U.S. Philips Corporation. Gripping device. 4,839,961, Cl. 29-740.000.

Vermeulen-Hollandia Octrooien II B.V.: *See*—
Bekkema, Jeen, 4,841,205, Cl. 318-282.000.

Vexcel Corporation: *See*—
Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, 4,841,455, Cl. 364-525.000.

VG Instruments Group Limited: *See*—
Jessop, Paul A., 4,840,074, Cl. 73-864.810.

Victoor, Johnny: *See*—
Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, 4,840,203, Cl. 139-453.000.

Victor Company of Japan, Ltd.: *See*—
Nishimoto, Naomichi; Okauchi, Takeshi; and Kido, Koichi, 4,841,383, Cl. 360-33.100.
Ohtake, Yoshichi, 4,840,470, Cl. 350-429.000.

Vigano, Liliana: *See*—
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.

Vigarie, Jean-Pierre; Carlach, Jean-Claude; and Penard, Pierre, to Etat Francais, Administration des P.T.T. (Centre National d'Etudes des Telecommunications); and Etabilissement Public dit "Telediffusion de France". Random access memory and linear interpolation circuit comprising application thereof. 4,841,462, Cl. 364-723.000.

Vijay, Tumkur R.; and Mannen, Bryce L., to FMC Corporation. Tire changer safety post. 4,840,215, Cl. 157-1.000.

Villela, Gerard: *See*—
Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, 4,840,442, Cl. 350-1.600.

Vincent, Gary A., to Dow Corning Corporation. Anti-treeing additives. 4,840,983, Cl. 524-265.000.

Virag, Sandor: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, to Givaudan Corporation. 2-alkyl-3-haloisothiazol-3-thione. 4,841,063, Cl. 548-213.000.

Vitolin, Rasma O.: *See*—
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.

Vladkova, Todorka G.: *See*—
Golander, Carl G.; Jonsson, Erik S.; and Vladkova, Todorka G., 4,840,851, Cl. 428-523.000.

Voest-Alpine Aktiengesellschaft: *See*—
Haider, Gottfried, 4,840,310, Cl. 239-533.400.
Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, 4,841,542, Cl. 373-73.000.

Vogel, Friedrich: *See*—
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.

Vogt, Winold, to Pfleiderer Industrie GmbH & Co., KG. Method for the production of fibrous plaster boards. 4,840,688, Cl. 156-39.000.

Vogtherr, Burkhard; and Elzenbeck, Manfred, to Davis Furniture Industries, Inc. Office chair. 4,840,426, Cl. 297-300.000.

Volejnik, Wilhelm, to Siemens Aktiengesellschaft. Method and apparatus for extracting an auxiliary data clock from the clock and/or the clock-phase of a synchronous or plesiochronic digital signal. 4,841,548, Cl. 375-110.000.

Vollhardt, Frohmut; and Kramer, Hans, to Man Gutehoffnungshuette GmbH. Process and a device for cleaning inner or outer walls of vertically extending or inverted tubes of heat exchangers. 4,840,145, Cl. 122-379.000.

von Broock, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Suspension system for a drive assembly of a helicopter. 4,840,330, Cl. 244-17.270.

von Daehne, Welf: *See*—
Godtfredsen, Wagn O.; and von Daehne, Welf, 4,840,944, Cl. 514-195.000.

Von Unger, Eckart-Alfred: *See*—
Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, 4,841,554, Cl. 378-57.000.

Voorhees, John L.; and Kemp, James, to Productive Products Limited. Child harness. 4,840,144, Cl. 119-96.000.

Vorwerk & Co. Interholding GmbH: *See*—
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, 4,840,828, Cl. 428-120.000.

Vuong, The A., to Telefunken Fernseh und Rundfunk GmbH. Transformation circuit arrangement. 4,841,465, Cl. 364-725.000.

W&A Bates Limited: *See*—
Goodfellow, Anthony G.; and Wright, Anthony R., 4,840,697, Cl. 156-405.100.

Wachob, David E., to General Instrument Corporation. Secure video distribution system. 4,841,569, Cl. 380-7.000.

Wachtel, Roberta S. Restraining vest. 4,840,189, Cl. 128-869.000.

Wacker Silicones Corporation: *See*—
Hoffman, Michael J., 4,840,742, Cl. 252-49.500.

Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, to Nihon Bunko Kogyo Kabushiki Kaisha. Apparatus for preparing sample solution for infrared spectrophotometer and method of analyzing sample solution. 4,841,145, Cl. 250-304.000.

Wada, Kenzo; and Nagata, Eiji, to NEC Corporation. Transistor devices for microwave oscillator elements. 4,841,353, Cl. 357-51.000.

Waddington, John D., to British Gas PLC. Heating stock in a heating chamber. 4,840,560, Cl. 432-59.000.

Wade, Leonard. Deodorant dispenser. 4,840,773, Cl. 422-124.000.

Wagner, Siegbert O.: *See*—
Fattori, Joseph E.; and Wagner, Siegbert O., 4,840,511, Cl. 401-213.000.

Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, to Sanofi; and Institut National de la Sante et de la Recherche Medicale. Peptide amino-alcohol derivatives containing a tetrasubstituted carbon atom, inhibiting renin and acid proteases, process for obtention and therapeutical use. 4,840,935, Cl. 514-18.000.

Wakamatsu, Hideki: *See*—
Noguchi, Hitoshi; and Wakamatsu, Hideki, 4,841,228, Cl. 324-62.000.

Wakamatsu, Masazumi: *See*—
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.

Wakefield, John J., Jr., to Atlantic Richfield Company. Method for determining and controlling the amount of finely divided particulate solids added to a stream of fluid. 4,840,726, Cl. 208-152.000.

Waldmann, Herman: *See*—
Cobboid, Stephen P.; and Waldmann, Herman, 4,841,025, Cl. 530-387.000.

Waldner, Charles, to United Foam Plastics Corporation. Packing device having support tab. 4,840,277, Cl. 206-523.000.

Walker, Fritz: *See*—
Goller, Ernst; and Walker, Fritz, 4,840,046, Cl. 66-144.000.

Walker, Stewart M.: *See*—
McFarlane, Robert; and Walker, Stewart M., 4,840,128, Cl. 108-50.000.

Walley, Darlene R.: *See*—
Hardy, Frederick E.; and Walley, Darlene R., 4,840,738, Cl. 252-8.600.

Walter, Eckhard, to Rahmen mit System GmbH. Closed decoration frame. 4,839,974, Cl. 40-152.000.

Walter, Martin J., to United States of America, Air Force. Reflection technique for thermal mapping of semiconductors. 4,841,150, Cl. 250-339.000.

Walters, Donald M., Jr., to Advanced Micro Devices, Inc. CMOS RAM data compare circuit. 4,841,279, Cl. 340-146.200.

Walton, Erick G.: *See*—
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.

Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., to SECO Industries, Inc. Odor control product dispenser. 4,840,770, Cl. 422-49.000.

Wang, Chih-Chung: *See*—
Chalilpoyil, Purush; Parsen, Frank E.; and Wang, Chih-Chung, 4,840,644, Cl. 29-623.100.

Wang, Robert, to Societe Stein Heurtey, Z.A.I. Method for degreasing a cold rolled metallic band. 4,840,680, Cl. 134-40.000.

Wang, Yuqiang: *See*—
Farquhar, David; and Wang, Yuqiang, 4,841,085, Cl. 538-180.000.

Wanger, Werner: *See*—
Gschwend, Hans; Hachtel, Hans; and Wanger, Werner, 4,840,527, Cl. 411-344.000.

Ward, Benjamin D.: *See*—
Szuminski, Gary F.; and Ward, Benjamin D., 4,840,329, Cl. 244-12.500.

Warga, Johann: *See*—
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.

Warner-Lambert Company: *See*—
Domagala, John M.; Hagen, Susan E.; Sanchez, Joseph P.; and Solomon, Marjorie S., 4,840,956, Cl. 514-312.000.
Sircar, Ila, 4,840,955, Cl. 514-278.000.

Washburn, Robert D.; and McClanahan, Robert F., to Hughes Aircraft Company. Non-saturating magnetic amplifier controller. 4,841,428, Cl. 363-75.000.

Washburn, Robert D.: *See*—
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.

Washington Technology Center: *See*—
Chalupnik, James D.; Garbini, Joseph L.; and Jorgensen, Jens E., 4,841,224, Cl. 324-61.00P.

Wasileski, John M., to National Distillers and Chemical Corporation. Continuous process for the preparation of immobilized glucoamylase. 4,840,900, Cl. 435-96.000.

Waszkiewicz, Paul, to Photon Devices, Ltd. Document scanner with resolution selection control. 4,841,142, Cl. 250-227.000.

Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, to TDK Corporation. Deflection apparatus for cathode ray tube. 4,841,267, Cl. 335-210.000.

Watanabe, Atsumi: *See*—
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, 4,841,514, Cl. 369-100.000.

Watanabe, Hiroyuki, to Pilot Precision Kabushiki Kaisha. Mechanical pencil capable of automatically propelling successive lengths of lead. 4,840,508, Cl. 401-65.000.

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Watanuki, Kiyoshi: *See*—
Takizawa, Kazuyoshi; and Watanuki, Kiyoshi, 4,841,201, Cl. 315-411.000.

Watkins, Charles W., to Tuftco Corporation. Needle plate for hook bar of cut pile tifting machine. 4,840,133, Cl. 112-80.300.

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Weaver, Charles S., to Digital Recording Research Limited Partnership. Method and apparatus for digital encoding and decoding. 4,841,299, Cl. 341-65.000.
Webb, James E. Surge brake apparatus for gooseneck trailers. 4,840,256, Cl. 188-112.00R.
Weber, Darrell A. Convertible top. 4,840,420, Cl. 296-116.000.
Weber, Franz K., to Modulite Corporation. Knockdown ring frame for lamp shade. 4,841,424, Cl. 362-352.000.
Weber, Reinhold; Zuern, Ludwig; and Weilbacher, Manfred, to BASF Aktiengesellschaft. Production of closed-celled foams of high compressive strength. 4,840,976, Cl. 521-79.000.
Weber, Robert: *See*—
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Wedding, Brent M.: *See*—
Borrelli, Nicholas F.; and Wedding, Brent M., 4,840,655, Cl. 65-30.110.
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Weekley, David L.; and Parker, Ivan, to Vac Tec, Inc. Apparatus for shielding a molten metal stream. 4,840,297, Cl. 222-607.000.
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Pauling, Horst; and Wehrli, Christof, 4,841,070, Cl. 549-34.000.
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Weidelt, Manfred: *See*—
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Weiner, Nathan K., to Delphax Systems. RF driver and control. 4,841,313, Cl. 346-159.000.
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., to Collins & Aikman Corporation. Molded automobile headliner. 4,840,832, Cl. 428-156.000.
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Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,861, Cl. 430-59.000.
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Welcome, Warren W.: *See*—
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Novak, Frank; and Fleiss, Hartmut W., 4,841,123, Cl. 219-125.120.
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Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., to University of Texas System, The. Pulsed generator incorporating output waveform flexibility and a pulsed transformer. 4,841,217, Cl. 322-8.000.
Welkey, Joseph J., to Taper-Lok Corporation. Swivel flow line connector. 4,840,409, Cl. 285-167.000.
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Husemeyer, Hans; Mager, Herbert; and Konrad, Eugen, 4,840,639, Cl. 8-410.000.
Weller, Karl-Heinz: *See*—
Freitag, Elmar; Weller, Karl-Heinz; and Trube, Hans-Wilhelm, 4,840,113, Cl. 98-2.000.
Welschof, Hans-Heinrich; and Beier, Rudolf, to Lohr & Bromkamp GmbH. Differential gear assembly including at least one integrated constant velocity universal joint. 4,840,087, Cl. 74-713.000.
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Hurlemann, Ernst; Muller, Kurt; and Ruppen, Bruno, 4,840,108, Cl. 89-33.140.
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Westell, William E., to Honeywell Inc. Web handling device. 4,841,317, Cl. 354-65.000.
Western Digital Corporation: *See*—
Chung, Randall M.; and Masters, Bradley S., 4,841,174, Cl. 307-469.000.
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Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., 4,840,305, Cl. 228-232.000.
Jose, Vince A., 4,840,132, Cl. 110-246.000.
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Silvestri, George J., Jr., 4,840,537, Cl. 415-202.000.
Twerdochlib, Michael, 4,840,063, Cl. 73-203.000.
Udren, Eric A., 4,841,405, Cl. 361-80.000.
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Jones, Elwyn D.; Lauzon, Robert; and Wetter, Bruno, 4,840,609, Cl. 493-28.000.
Wetzel, Robert E., to Dayco Products, Inc. Synchronous drive system and method of making the same. 4,840,606, Cl. 474-153.000.
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Carr, Keith E., 4,840,285, Cl. 220-47.000.
White, Craig E.; and Hodge, Bobby L., to INA Bearing Company, Inc. Linear needle roller bearing. 4,840,600, Cl. 464-111.000.
White, Vernon E.: *See*—
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Wieringa, Peter A.: *See*—
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Wilczynski, Janusz S.: *See*—
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Wild, Leslie; and Lee, Chun D., to Quantum Chemical Corporation. Polymeric composition. 4,840,996, Cl. 525-193.000.
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Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., 4,840,810, Cl. 426-312.000.
Williams, George H., to British Aerospace PLC. Trailing edge flaps for aircraft wings. 4,840,331, Cl. 244-212.000.
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Williamson, Archie O., to Williamson Patent Holding Company. Axle-controlled, positive differential. 4,840,089, Cl. 74-690.000.
Williamson, Edward; and Pfeiffer, Stanley, to Becton Dickinson & Company. Incubator for reagents. 4,840,771, Cl. 422-104.000.
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Williamson, Robert M. Adjustable bed system. 4,839,932, Cl. 5-68.000.
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Wilson, John A., to Hijack Light, Inc., The. Omnibus alarm signaling system. 4,841,277, Cl. 340-426.000.

Wilson, John H.: *See*—
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Winter, Daryl B.: *See*—
Meyer, Richard S.; Root, Jeffrey M.; Campbell, Michael L.; and Winter, Daryl B., 4,840,815, Cl. 426-611.000.
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Epstein, Arthur J.; Ewing, Joan R.; and Swift, Joseph A., 4,841,099, Cl. 174-68.500.
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Yamada, Jiro; Haseoka, Masahide; and Obata, Isao, to Matsushita Electric Industrial Co., Ltd. System for recording information from one recording medium onto a reversing cassette tape recording medium without loss of information during a reversing operation. 4,841,503, Cl. 369-14.000.
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Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, 4,840,856, Cl. 429-192.000.
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Yamada, Yasuyuki; and Nakazawa, Isao, to Canon Kabushiki Kaisha. Changeable magnification optical system. 4,840,466, Cl. 350-422.000.
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Yamaguchi, Hirohisa; and Mashimo, Akira, to Teac Corporation. Method and apparatus for recording an information signal on a rotary recording medium. 4,841,504, Cl. 369-32.000.
Yamaguchi, Keiji, to Terumo Corporation. Sphygmomanometer adopting recognition of korotkoff sounds. 4,840,181, Cl. 128-680.000.
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Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. Power transmission control system for a four-wheel drive vehicle. 4,840,246, Cl. 180-247.000.
Yamamoto, Hiroshi; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Camera system. 4,841,327, Cl. 354-412.000.
Yamamoto, Hiroyuki; and Matsunawa, Masahiko, to Konishiroku Photo Industry Co., Ltd. Shading correcting method enabling prevention of effect of noise and apparatus therefor. 4,841,376, Cl. 358-282.000.
Yamamoto, Hiroyuki: *See*—
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Yamamoto, Kazuo; Ono, Katsuyasu; and Yamamuro, Shinichi, to Nippon Seiko Kabushiki Kaisha; and Chuo Hatsujo Kabushiki Kaisha. Automatic locking and releasing arrangement for vehicular seat belt. 4,840,402, Cl. 280-804.000.
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Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, to Minolta Camera Kabushiki Kaisha. Camera system with mode selecting device. 4,841,318, Cl. 354-173.100.
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Yamamoto, Saburo: *See*—
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Yamanaka, Akira: *See*—
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Yamano, Shoji: *See*—
Toyoda, Yoshiharu; Mikata, Yoshitaka; and Yamano, Shoji, 4,840,240, Cl. 177-25.180.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, 4,841,077, Cl. 549-402.000.

Yamanoue, Masafumi: *See*—
Kotani, Matahira; Hayashi, Motohiko; and Yamanoue, Masafumi, 4,841,374, Cl. 358-280.000.

Yamashita, Masakazu: *See*—
Nozu, Shinsaku; Kase, Masao; and Yamashita, Masakazu, 4,841,518, Cl. 369-270.000.

Yamashita, Mithuo: *See*—
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, 4,840,104, Cl. 84-437.000.

Yamashita, Mitsuru: *See*—
Izuka, Akihiro; Onizawa, Yoshio; and Yamashita, Mitsuru, 4,841,501, Cl. 369-13.000.

Yamashita, Tatsuo; and Ishiguro, Kazuyoshi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakuso. Guide rail cover. 4,840,401, Cl. 280-804.000.

Yamatake-Honeywell Co. Ltd.: *See*—
Kadoya, Norio; Kawachi, Jun; and Miyazawa, Keiji, 4,841,296, Cl. 340-870.160.

Yamato, Akihiro; and Hashiguchi, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Intake air quality control method for internal combustion engines at termination of fuel cut operation. 4,840,156, Cl. 123-339.000.

Yamato Scale Company, Limited: *See*—
Toyoda, Yoshiharu; Mikata, Yoshitaka; and Yamano, Shoji, 4,840,240, Cl. 177-25.180.

Yamauchi, Satomi, to Mitsubishi Denki Kabushiki Kaisha. Sewing machine controller inhibiting sewing in unsafe conditions. 4,840,135, Cl. 112-277.000.

Yamawaki, Takayuki: *See*—
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.

Yamazaki, Hitoshi: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.

Yamazaki, Katsuyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Time division channel switching circuit. 4,841,522, Cl. 370-64.000.

Yamazaki, Kouichi: *See*—
Watanabe, Kazuo; Furihata, Makoto; and Yamazaki, Kouichi, 4,841,484, Cl. 365-190.000.

Yamazaki, Nobuo: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,841,461, Cl. 364-572.000.

Yamazaki, Toru: *See*—
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, 4,840,926, Cl. 501-134.000.

Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, to Kabushiki Kaisha Toshiba. CO_2 gas laser device. 4,841,538, Cl. 372-58.000.

Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizawa, Isamu, to Hitachi, Ltd. Multiple throttle mechanism for internal combustion engines. 4,840,146, Cl. 123-52.0MB.

Yananton, Patrick; and Parker, Janice P. Securing means for odorless animal litter unit. 4,840,140, Cl. 119-1.000.

Yandle, Sylvester E., II. Hydraulic hammer reduction system for railroad tank cars. 4,840,192, Cl. 137-681.000.

Yandora, Andrew E.: *See*—
Heys, George, Jr.; Yandora, Andrew E.; and McDowell, Philip D., 4,841,412, Cl. 361-393.000.

Yang, Kap S.: *See*—
Cuculo, John A.; Theil, Michael H.; Yang, Kap S.; and Chen, Yue S., 4,840,673, Cl. 106-198.000.

Yano, Toshihiko: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,971, Cl. 514-721.000.

Yarkosky, Eugene F.: *See*—
Schultz, Paul B.; and Yarkosky, Eugene F., 4,840,820, Cl. 427-305.000.

Yasuda, Kazuhito; and Kishi, Yutaka, to Fujitsu Limited. Process for fabricating an avalanche photodiode. 4,840,916, Cl. 437-3.000.

Yasuda, Naofumi: *See*—
Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, 4,840,488, Cl. 356-374.000.

Yasudomi, Norio: *See*—
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, 4,840,957, Cl. 514-326.000.

Yasui, Toshihiko, to Shimano Industrial Company Limited. Fishing rod. 4,839,981, Cl. 43-18.100.

Yasukawa, Nihiko: *See*—
Tomikawa, Arifumi; and Yasukawa, Nihiko, 4,840,258, Cl. 190-102.000.

Yasumura, Kiyoshi: *See*—
Sakamoto, Seiji; and Yasumura, Kiyoshi, 4,840,830, Cl. 428-141.000.

Yasuoka, Koichi: *See*—
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, 4,841,538, Cl. 372-58.000.

Yasutomi, Tsuyoshi: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.

Yau, Yung-Herng: *See*—
Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, 4,840,712, Cl. 204-28.000.

Yazaki Corporation: *See*—
Oikawa, Ryuetsu; and Fujita, Akihiko, 4,839,937, Cl. 16-2.000.

Yhtyneet Paperitehtaat Oy Jylhavaara: *See*—
Gustafsson, Helmer, 4,840,318, Cl. 241-294.000.

Yip, Douglas: *See*—
Nierescher, David; and Yip, Douglas, 4,840,576, Cl. 439-331.000.

Yokogawa Electric Corporation: *See*—
Yamagishi, Hideaki; and Nomiyama, Mayumi, 4,841,272, Cl. 338-2.000.

Yokogawa Medical Systems, Limited: *See*—
Nagai, Hideo, 4,841,553, Cl. 378-19.000.

Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, to Murata Manufacturing Co.,Ltd. Method of manufacturing circuit component such as stator for variable resistor. 4,839,960, Cl. 29-620.000.

Yokoo, Chihiro: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.

Yokosawa, Seiichi, to Pioneer Electronic Corporation. Digital signal reproducing apparatus. 4,841,390, Cl. 360-77.140.

Yokoyama, Isao: *See*—
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.

Yokoyama, Michihiro, to Kabushiki Kaisha Yokoyama Seisakusho. Process for manufacturing toothed parts. 4,839,952, Cl. 29-159.200.

Yokoyama, Shouji: *See*—
Yamamoto, Masanari; Ito, Yasunobu; and Yokoyama, Shouji, 4,841,445, Cl. 364-424.100.

Yon, Steven A.; and Diaz, Luis A., to NCR Corporation. Power supply switching circuit. 4,841,160, Cl. 307-66.000.

Yonemura, Masaaki: *See*—
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.

Yoneyama, Mitsuho: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.

Yoneyama, Tomio: *See*—
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Yonezu, Kazuya; and Matsumoto, Keiji, to NEC Corporation. Control processor for controlling a peripheral unit. 4,841,440, Cl. 364-200.000.

Yoshida, Akira; and Sasaki, Yuuichi, to Fujitsu Limited. System for generating mask pattern for vector data processor. 4,841,438, Cl. 364-200.000.

Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, to Mitsubishi Denki K.K. Error correction encoder/decoder. 4,841,300, Cl. 341-94.000.

Yoshida, Kazuetsu: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.

Yoshida Kogyo K. K.: *See*—
Akiyama, Hideki; and Morita, Toyoo, 4,839,963, Cl. 29-766.000.
Murai, Ryukichi, 4,839,946, Cl. 24-115.00G.
Osaki, Tatsuo, 4,839,956, Cl. 29-408.000.
Seki, Fumio, 4,840,301, Cl. 227-139.000.

Yoshida Kogyo K.K.: *See*—
Masuda, Yuichi; and Shimizu, Kozo, 4,840,322, Cl. 242-67.10R.

Yoshida, Masanobu, to Fujitsu Limited. Semiconductor integrated circuit adapted to carry out operation test. 4,841,233, Cl. 324-73.00R.

Yoshida, Shotaro: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.

Yoshida, Susumu: *See*—
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.

Yoshida, Tomio: *See*—
Kubota, Shinji; Hirosawa, Kazutoyo; and Yoshida, Tomio, 4,841,512, Cl. 369-54.000.

Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Buried type semiconductor laser device. 4,841,534, Cl. 372-46.000.

Yoshida, Tsukasa; Ishige, Yoshio; Matsudaira, Masaki; and Takahashi, Tadashi, to Sanmatsu Kogyo Kabushiki Kaisha. Branched dextrin production and compositions containing same. 4,840,807, Cl. 426-48.000.

Yoshida, Yasunori: *See*—
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, 4,840,988, Cl. 524-476.000.

Yoshida, Yuji: *See*—
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.

Yoshihara, Junji: *See*—
Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, 4,841,036, Cl. 534-761.000.

Yoshikawa, Masanori; and Watanabe, Shuichi, to Matsushita Electric Industrial Co., Ltd. Thermal copying apparatus. 4,841,154, Cl. 250-317.100.

Yoshikura, Takashi: *See*—
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.

Yoshimura, Shigeyuki: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Yoshimura, Shohei: *See*—
Kuwabara, Hideki; and Yoshimura, Shohei, 4,840,973, Cl. 521-58.000.

Yoshimura, Takashi: *See*—
Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.

Yoshinaga, Noriyuki: *See*—
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, 4,840,858, Cl. 429-197.000.

Yoshino, Kunihisa: *See*—
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, 4,841,337, Cl. 355-157.000.

Yoshino, Tatsuo: *See*—
Nishiyama, Mikio; Yoshino, Tatsuo; and Akimoto, Taizo, 4,841,371, Cl. 358-244.000.

Yoshioka, Yoshio: *See*—
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.

Yoshizawa, Akihiko, to Olympus Optical Co., Ltd. Optical characteristic measuring apparatus for an optical recording medium substrate. 4,841,510, Cl. 369-46.000.

Yoshizumi, Haruo: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Youd, T. Leslie; and Jackson, Garrett O., to Electric Power Research Institute, Inc. Retrievable wedging system for coupling downhole devices into cased bore holes. 4,840,230, Cl. 166-382.000.

Young, Gary. Protective device for coils of metal. 4,840,274, Cl. 206-389.000.

Young, John M.: *See*—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,840,965, Cl. 514-450.000.

Young, Sidney F. Method and article of manufacture for inserting contact lens. 4,840,478, Cl. 351-177.000.

Ytkemiska Institutet: *See*—
Golander, Carl G.; Jonsson, Erik S.; and Vladkova, Todorka G., 4,840,851, Cl. 428-523.000.

Yue, Stephen: *See*—
Boratto, Francisco; Yue, Stephen; and Jonas, John J., 4,840,051, Cl. 72-11.000.

Yui, Hiroshi: *See*—
Ohmori, Michio; Okamura, Michiya; and Yui, Hiroshi, 4,841,516, Cl. 369-264.000.

Yukutomo, Masashi: *See*—
Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, 4,841,432, Cl. 364-191.000.

Zabrenski, John S., to Air Products and Chemicals, Inc. Piston-backed gas pressure regulator. 4,840,195, Cl. 137-312.000.

Zahir, Sheik A.: *See*—
Tieke, Bernd; and Zahir, Sheik A., 4,840,999, Cl. 525-332.100.

Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, to Voest-Alpine Aktiengesellschaft. Electric furnace arrangement. 4,841,542, Cl. 373-73.000.

Zambon S.p.A.: *See*—
Della Bella, Davide; Carenzi, Angelo; Chiarino, Dario; and Pellacini, Franco, 4,840,936, Cl. 514-18.000.

Zandveld, Frederik; and Van Der Vliet, Peter C. L., to U.S. Philips Corporation. Computer system with work stations at remote positions and reserve battery power supply. 4,841,474, Cl. 364-900.000.

Zaugg, Hans, to ETA SA Fabriques d'Ebauches. Support formed of rigid plastic material. 4,840,337, Cl. 248-115.000.

Zavacki, Robert G. Tool retention device. 4,840,273, Cl. 206-372.000.

Zdrahala, Richard J.; and Strand, Marc A., to Becton Dickinson and Company. Fluorinated polyetherurethanes and medical devices therefrom. 4,841,007, Cl. 528-28.000.

Zeiler, Hans-Joachim: *See*—
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,841,059, Cl. 546-312.000.

Zeitler, Herman R.: *See*—
Howton, Kenneth D.; Stewart, Robert G.; and Zeitler, Herman R., 4,841,356, Cl. 337-248.000.

Zell, Karl: *See*—
Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,840,573, Cl. 439-92.000.

Zelle, Edgar: *See*—
Hauke, Dieter; and Zelle, Edgar, 4,841,187, Cl. 310-171.000.

Zemek, Albert W., to Universal Instruments Corporation. Adjustable width chain conveyor. 4,840,268, Cl. 198-817.000.

Zenhausern, Heinrich; and Weber, Robert, to Zenhausern, Heinrich. Process for making encapsulated anchor rung. 4,840,761, Cl. 264-254.000.

Zenith Electronics Corporation: *See*—
Dougherty, Lawrence W.; and Kraner, James L., 4,840,596, Cl. 445-30.000.
Lee, Sae D., 4,841,372, Cl. 358-247.000.

Zeno, John R., to Allied-Signal Inc. Third dimension pop up generation from a two-dimensional transformed image display. 4,841,292, Cl. 340-736.000.

Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., to AGA A.B. Methods and apparatus for forming glass articles. 4,840,656, Cl. 65-85.000.

Zielke, Horst: *See*—
Kotzab, Werner; and Zielke, Horst, 4,840,150, Cl. 123-90.390.

Zimmerman, Larry D.: *See*—
Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.

Zip-Pak Incorporated: *See*—
Boeckmann, Hugo, 4,840,012, Cl. 53-410.000.

Zipprath, Michael; and Schmidt, Dieter, to INA Walzlager Schaeffler KG. Valve control device. 4,840,160, Cl. 123-467.000.

Zollner, Christine; and Hahn, Herbert, to C. Contradty Nurnberg GmbH & Co. KG. Inert composite electrode, in particular an anode for molten salt electrolysis. 4,840,718, Cl. 204-286.000.

Zolyomi, Gabor: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Zondler, Helmut; Hubele, Adolf; and Nyfeler, Robert, to Ciba-Geigy Corporation. N-(2-nitrophenyl)-5-aminopyrimidine derivatives and useful for controlling harmful micro-organisms. 4,840,662, Cl. 71-92.000.

Zook, J. David: *See*—
Sullivan, Charles T.; and Zook, J. David, 4,841,140, Cl. 250-226.000.

Zoschke, Andreas: *See*—
Quadranti, Marco; Schmidli, Wilheim; and Zoschke, Andreas, 4,840,663, Cl. 71-93.000.

Zuern, Ludwig: *See*—
Weber, Reinhold; Zuern, Ludwig; and Weilbacher, Manfred, 4,840,976, Cl. 521-79.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JUNE, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Elias, Donald R., executor: *See—*
Elias, Robert T., deceased; and Elias, Donald R., executor, Re. 32,957, Cl. 604-368.000.

Elias, Robert T., deceased; and Elias, Donald R., executor, to Johnson & Johnson. Absorbent article. Re. 32,957, Cl. 604-368.000.

Fuji Photo Film Co., Ltd.: *See—*
Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, Re. 32,959, Cl. 354-403.000.

Hanada, Tsuneo: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Honeywell Inc.: *See—*
Levine, Michael R., Re. 32,960, Cl. 364-557.000.

Ishii, Toshio: *See—*
Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, Re. 32,959, Cl. 354-403.000.

Johnson & Johnson: *See—*
Elias, Robert T., deceased; and Elias, Donald R., executor, Re. 32,957, Cl. 604-368.000.

Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, to Toray Silicone Co., Ltd. Thermosetting epoxy resin compositions. Re. 32,958, Cl. 525-476.000.

Lamusga, Gary R., to Toro Company, The. Lawn mower grass collector bag support. Re. 32,954, Cl. 56-202.000.

Levine, Michael R., to Honeywell Inc. Electronic thermostat. Re. 32,960, Cl. 364-557.000.

Macy, Amelita J., executor: *See—*
Macy, Lawrence E., deceased, Re. 32,955, Cl. 123-198.00D.

Macy, Lawrence E., deceased (by Macy, Amelita J., executor), to Muncie Power Products, Inc. Electronic overspeed switch. Re. 32,955, Cl. 123-198.00D.

Maemori, Takashi: *See—*
Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, Re. 32,959, Cl. 354-403.000.

Manville Service Corporation: *See—*
Schuster, Richard L., Re. 32,956, Cl. 206-428.000.

Morita, Yoshitsugu: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Muncie Power Products, Inc.: *See—*
Macy, Lawrence E., deceased, Re. 32,955, Cl. 123-198.00D.

Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, to Fuji Photo Film Co., Ltd. Automatic focusing apparatus. Re. 32,959, Cl. 354-403.000.

Schuster, Richard L., to Manville Service Corporation. Carton and blank therefor. Re. 32,956, Cl. 206-428.000.

Shinmi, Hideo: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Toray Silicone Co., Ltd.: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Toro Company, The: *See—*
Lamusga, Gary R., Re. 32,954, Cl. 56-202.000.

U.S. Philips Corporation: *See—*
Wagner, Wolfgang, Re. 32,961, Cl. 378-4.000.

Wagner, Wolfgang, to U.S. Philips Corporation. Device for measuring local radiation absorption in a body. Re. 32,961, Cl. 378-4.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AMCA International Corporation: *See—*
Heckelsberg, Robert E., B1 4,193,247, Cl. 52-713.000.

Heckelsberg, Robert E., to AMCA International Corporation. Panel mounting clip. B1 4,193,247, 6-20-89, Cl. 52-713.000.

Malot, James J.: *See—*
Visser, Melvin J.; and Malot, James J., B1 4,593,760, Cl. 166-267.000.

Soltis, Charles W. Air filtering and distribution for laminar flow clean room. B1 4,603,618, 6-20-89, Cl. 98-31.500.

Upjohn Company, The: *See—*
Visser, Melvin J.; and Malot, James J., B1 4,593,760, Cl. 166-267.000.

Visser, Melvin J.; and Malot, James J., to Upjohn Company, The. Removal of volatile contaminants from the vadose zone of contaminated ground. B1 4,593,760, 6-20-89, Cl. 166-267.000.

LIST OF DESIGN PATENTEES

A/S Jotul: *See—*
Heger, Niels E., 301,736, Cl. D23-404.000.

Adams, Duane D., to North American Philips Corporation. Vacuum cleaner. 301,783, 6-20-89, Cl. D32-18.000.

AGA Aktiebolag: *See—*
Wingbro, Torgny; and Bergstrom, Leif, 301,793, Cl. D34-93.000.

Ahlers, Ronald E.; and Emmerling, Ronald, to J.C. Penney Co. Inc. Control housing for an electric blanket. 301,694, 6-20-89, Cl. D10-50.000.

Alco Industries, Inc.: *See—*
Goetz, Charles R., 301,785, Cl. D32-53.100.

Allbritton, Michael, to Skeeter Products, Inc. Boat. 301,711, 6-20-89, Cl. D12-314.000.

Allen, David W.; and Kramer, David K., to Honiton Investments, N.V. Hydro-therapy fitting. 301,731, 6-20-89, Cl. D23-213.000.

Ambasz, Emilio. Combined toothbrush and container therefor. 301,660, 6-20-89, Cl. D4-108.000.

Anderson, Bruce O.: *See—*
Bush, Paul; and Anderson, Bruce O., 301,664, Cl. D6-436.000.

Annick Goutal (a limited liability company): *See—*
Goutal, Annick, 301,760, Cl. D26-113.000.

Archetype Gallery, Inc.: *See—*
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Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 301,771, 6-20-89, Cl. D28-76.000.
Barber, Michael G. Baby bottle. 301,741, 6-20-89, Cl. D24-47.000.
Barrs, Amy W.; Brown, Kurtis L.; Dickson, James F.; and Englebert, Stephen M., to Kimberly-Clark Corporation. Rolled material dispenser. 301,667, 6-20-89, Cl. D6-518.000.
Baxter International Inc.: *See*—
Wyzgala, Mark; and Morizio, Thomas E., 301,742, Cl. D24-52.000.
Bergstrom, Leif: *See*—
Wingbro, Torgny; and Bergstrom, Leif, 301,793, Cl. D34-93.000.
Bernstein, Michael. Motorcycle oil gauge fitting. 301,703, 6-20-89, Cl. D12-114.000.
Bethany, Elizabeth A. Dental floss holder. 301,770, 6-20-89, Cl. D28-64.000.
Bienwald, Wolfgang F.: *See*—
Pearse, James N.; and Bienwald, Wolfgang F., 301,675, Cl. D8-14.000.
BioClinical Systems, Inc.: *See*—
Powers, John H., 301,737, Cl. D24-8.000.
Bolan, Michael L.; Scherpenberg, Francis A.; and Davies, William F., Jr., to Dallas Semiconductor Corporation. Portable memory module. 301,713, 6-20-89, Cl. D14-114.000.
Bolzern, Carmen: *See*—
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Bover, Antonio G., to Girbau, S.A. Washing machine. 301,781, 6-20-89, Cl. D32-6.000.
Bover, Antonio G., to Girbau, S.A. Washing machine. 301,782, 6-20-89, Cl. D32-6.000.
Brown, Kurtis L.: *See*—
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Brown, Paul D., to Reebok International Ltd. Element of a shoe upper. 301,657, 6-20-89, Cl. D2-314.000.
Brune, David C. Toy robot. 301,727, 6-20-89, Cl. D21-166.000.
Bryne & Davidson Doors (N.S.W.) Pty. Limited: *See*—
Schremmer, Paul M., 301,744, Cl. D25-49.000.
Burkstrand, George: *See*—
Burkstrand, Lowell; and Burkstrand, George, 301,745, Cl. D25-119.000.
Burkstrand, Lowell; and Burkstrand, George. Wallboard ceiling runner. 301,745, 6-20-89, Cl. D25-119.000.
Burle Technologies, Inc.: *See*—
Greenlee, Hugh T.; and Hess, Roy P., 301,696, Cl. D10-106.000.
Bush Industries, Inc.: *See*—
Bush, Paul; and Anderson, Bruce O., 301,664, Cl. D6-436.000.
Bush, Paul; and Anderson, Bruce O., to Bush Industries, Inc. Video storage cart or the like. 301,664, 6-20-89, Cl. D6-436.000.
Byrne & Davidson Doors (N.S.W.) Pty. Limited: *See*—
Schremmer, Paul M., 301,743, Cl. D25-49.000.
Camens, Murray I. C., to U.S. Philips Corporation. Radio receiver. 301,715, 6-20-89, Cl. D14-192.000.
Canta, Vittorio. Wrist watch. 301,693, 6-20-89, Cl. D10-39.000.
Capjon, Jan, to J. Oglaend, Inc. Ergometer. 301,729, 6-20-89, Cl. D21-194.000.
Casio Computer Co., Ltd.: *See*—
Ohzu, Itsumi, 301,716, Cl. D14-188.000.
Wakamatsu, Masamichi, 301,692, Cl. D10-38.000.
Cassidy, Bruce A.; and Gray, James O. Mine roof support plate. 301,687, 6-20-89, Cl. D8-399.000.
Chou, Fargo. Retractable comb. 301,769, 6-20-89, Cl. D28-21.000.
Coca-Cola Company, The: *See*—
Schechter, Alvin H.; and Thompson, Carl R., 301,672, Cl. D7-398.000.
Coleman, Brenda D. Eardrop holder. 301,700, 6-20-89, Cl. D11-86.000.
Comstock, Todd M., to Renoir Candles, Ltd. Liquid candle. 301,749, 6-20-89, Cl. D26-9.000.
Contractor, Avinash M.; Auslander, David E.; and Grimm, Wayne M., to Rorer Pharmaceutical Corporation. Pharmaceutical tablet. 301,764, 6-20-89, Cl. D28-2.000.
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., to Rorer Pharmaceutical Corporation. Pharmaceutical tablet. 301,765, 6-20-89, Cl. D28-2.000.
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., to Rorer Pharmaceutical Corporation. Pharmaceutical tablet. 301,766, 6-20-89, Cl. D28-2.000.
Cosmede Anstalt: *See*—
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Daar, Yair; and Yahav, Shimon. Depilator. 301,738, 6-20-89, Cl. D24-26.000.
Dallaire, Dominique: *See*—
Dallaire, Raymond; and Dallaire, Dominique, 301,746, Cl. D25-122.000.
Dallaire, Raymond; and Dallaire, Dominique, to P.H. Tech Inc. Window frame extrusion. 301,746, 6-20-89, Cl. D25-122.000.
Dallas Semiconductor Corporation: *See*—
Bolan, Michael L.; Scherpenberg, Francis A.; and Davies, William F., Jr., 301,713, Cl. D14-114.000.
Davies, William F., Jr.: *See*—
Bolan, Michael L.; Scherpenberg, Francis A.; and Davies, William F., Jr., 301,713, Cl. D14-114.000.
DeCandia, Giovanni, to FL Industries, Inc. Combined outdoor floodlight and photo electric control therefor. 301,754, 6-20-89, Cl. D26-63.000.
DeCastro, Fernando V. Patient weight basket. 301,695, 6-20-89, Cl. D10-94.000.
Denz & Co., AG: *See*—
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De Oliveira, Egidio L.: *See*—
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DeYarman, James B. Applicator for applying cream for baldness. 301,767, 6-20-89, Cl. D28-7.000.
Diaz, Juan A., to Reebok International Ltd. Element of a shoe sole. 301,656, 6-20-89, Cl. D2-314.000.
Dickson, James F.: *See*—
Barrs, Amy W.; Brown, Kurtis L.; Dickson, James F.; and Englebert, Stephen M., 301,667, Cl. D6-518.000.
Dwelly, Vernon I. Two-chamber inflatable air cushion. 301,669, 6-20-89, Cl. D6-601.000.
Eastman Kodak Company: *See*—
Giles, Brian A.; and Schwab, Frederick J., 301,779, Cl. D32-1.000.
Elleance Ltd.: *See*—
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Emmerling, Ronald: *See*—
Ahlers, Ronald E.; and Emmerling, Ronald, 301,694, Cl. D10-50.000.
Englebert, Stephen M.: *See*—
Barrs, Amy W.; Brown, Kurtis L.; Dickson, James F.; and Englebert, Stephen M., 301,667, Cl. D6-518.000.
Euroceltique S.A.: *See*—
Oshlack, Benjamin, 301,762, Cl. D28-2.000.
Ezaki, Akira; Orihara, Tazuo; and Yamaguchi, Kiminori, to Sharp Corporation. Combined clothes washer and drier. 301,780, 6-20-89, Cl. D32-5.000.
F. B. Nutter Enterprises, Inc.: *See*—
Vories, Dennis L., 301,685, Cl. D8-373.000.
Fasino, Victor. Bird feeder. 301,777, 6-20-89, Cl. D30-126.000.
Fasino, Victor. Bird feeder. 301,778, 6-20-89, Cl. D30-127.000.
Fenne, Kenneth R., to Pittway Corporation. Nightlight. 301,750, 6-20-89, Cl. D26-26.000.
Ferbrache, Raymond B.: *See*—
Fick, Orval L.; and Ferbrache, Raymond B., 301,689, Cl. D9-374.000.
Fick, Orval L.; and Ferbrache, Raymond B., to Gott Corporation. Gas container. 301,689, 6-20-89, Cl. D9-374.000.
Fiskars Oy Ab: *See*—
Linden, Erkki O., 301,678, Cl. D8-57.000.
FL Industries, Inc.: *See*—
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Forcolini, Carlo, to Artemide S.P.A. Standing lamp. 301,759, 6-20-89, Cl. D26-106.000.
Fujiki, Tetsushi, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,709, 6-20-89, Cl. D12-149.000.
Fumakilla Limited: *See*—
Murakami, Yukio; and Hara, Noboru, 301,773, Cl. D28-91.100.
Gardenswartz, Will H. Lockbox for videotapes or the like. 301,682, 6-20-89, Cl. D8-333.000.
Garner, Mary C. Combined dolls and carrier. 301,728, 6-20-89, Cl. D21-167.000.
Gaul, Robert J., to Archetype Gallery, Inc. Light fixture. 301,751, 6-20-89, Cl. D26-37.000.
Giles, Brian A.; and Schwab, Frederick J., to Eastman Kodak Company. Acoustical cleaning system. 301,779, 6-20-89, Cl. D32-1.000.
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Bover, Antonio G., 301,781, Cl. D32-6.000.
Bover, Antonio G., 301,782, Cl. D32-6.000.
Gismondi, Ernesto, to Artemide S.p.A. Adjustable lamp. 301,755, 6-20-89, Cl. D26-63.000.
Glaze, William W. Knife for cutting plastic cable insulation. 301,680, 6-20-89, Cl. D8-98.000.
Gobindram, Kash, to Kash 'N' Gold Ltd. Telephone set. 301,714, 6-20-89, Cl. D14-143.000.
Goetz, Charles R., to Alco Industries, Inc. Paint tray. 301,785, 6-20-89, Cl. D32-53.100.
Gott Corporation: *See*—
Fick, Orval L.; and Ferbrache, Raymond B., 301,689, Cl. D9-374.000.
Goutal, Annick, to Annick Goutal (a limited liability company). Combined light bulb attachment and scent releasing pebbles therefor. 301,760, 6-20-89, Cl. D26-113.000.
Gray, James O.: *See*—
Cassidy, Bruce A.; and Gray, James O., 301,687, Cl. D8-399.000.
Green, David T., to United States Surgical Corporation. Surgical stapler. 301,740, 6-20-89, Cl. D24-27.000.
Green, Richard D. Dual compartment bottle. 301,688, 6-20-89, Cl. D9-341.000.
Greenlee, Hugh T.; and Hess, Roy P., to Burle Technologies, Inc. Infrared radiation detector. 301,696, 6-20-89, Cl. D10-106.000.
Greutmann, Urs; and Bolzern, Carmen, to Denz & Co., AG. Office table. 301,666, 6-20-89, Cl. D6-480.000.
Grim, Wayne M.: *See*—
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., 301,765, Cl. D28-2.000.
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., 301,766, Cl. D28-2.000.
Grimm, Wayne M.: *See*—
Contractor, Avinash M.; Auslander, David E.; and Grimm, Wayne M., 301,764, Cl. D28-2.000.

Groves, Michael; Hume, Anthony; Sothcott, Jonathan; and Pemberton, Martin, to State Rail Authority of New South Wales. Rail car. 301,704, 6-20-89, Cl. D12-40.000.
Hans Rudolph, Inc.: *See*—
Rudolph, Kevin A.; and Zavala, Donald C., 301,774, Cl. D29-7.000.
Hanson, Mark L., to MinnFac, Inc. Free-standing deck light. 301,756, 6-20-89, Cl. D26-68.000.
Hanson, Mark L., to MinnFac, Inc. Bolt on deck light. 301,757, 6-20-89, Cl. D26-68.000.
Hara, Noboru: *See*—
Murakami, Yukio; and Hara, Noboru, 301,773, Cl. D28-91.100.
Hase, Yoshiaki, to Asics Corporation. Shoe sole. 301,658, 6-20-89, Cl. D2-320.000.
Havelock, Ken. Toy badger animal figure. 301,725, 6-20-89, Cl. D21-148.000.
Heger, Niels E., to A/S Jotul. Front panel for a fireplace. 301,736, 6-20-89, Cl. D23-404.000.
Herndon, Juanita. Combined container and applicator for hair tint. 301,768, 6-20-89, Cl. D28-20.000.
Herzog, Richard, to Illinois Tool Works Inc. Grommet for electrical wires. 301,684, 6-20-89, Cl. D8-356.000.
Hess, Roy P.: *See*—
Greenlee, Hugh T.; and Hess, Roy P., 301,696, Cl. D10-106.000.
Honiton Investments, N.V.: *See*—
Allen, David W.; and Kramer, David K., 301,731, Cl. D23-213.000.
Huang, Cheng-Chwen, to Shenjey Industrial Co., Ltd. Precision lathe. 301,717, 6-20-89, Cl. D15-130.000.
Huffy Corporation: *See*—
Ropp, William H., 301,705, Cl. D12-125.000.
Hui-Neng, Chi. Stapling gun or similar article. 301,676, 6-20-89, Cl. D8-49.000.
Hume, Anthony: *See*—
Groves, Michael; Hume, Anthony; Sothcott, Jonathan; and Pemberton, Martin, 301,704, Cl. D12-40.000.
Iacovelli, Marc R., to Rally Manufacturing, Inc. Combined battery powered light and universal spring action clip. 301,753, 6-20-89, Cl. D26-60.000.
Igarashi, Yasuo, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,706, 6-20-89, Cl. D12-136.000.
Igarashi, Yasuo, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,707, 6-20-89, Cl. D12-147.000.
Illinois Tool Works Inc.: *See*—
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Isaberg AB: *See*—
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Israel, Marcia. Electrical connector for a merchandise security system. 301,712, 6-20-89, Cl. D13-24.000.
Ivano, Morandi, to Metaltex Italia S.p.A. Serving cart. 301,790, 6-20-89, Cl. D34-21.000.
J.C. Penney Co. Inc.: *See*—
Ahlers, Ronald E.; and Emmerling, Ronald, 301,694, Cl. D10-50.000.
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Kabushiki Kaisha Yoshikawa Kuni Kogyosho: *See*—
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Yoshikawa, Toshimichi, 301,787, Cl. D34-1.000.
Kash 'N' Gold Ltd.: *See*—
Gobindram, Kash, 301,714, Cl. D14-143.000.
Kennedy, Charles B. Rotatable wine and glass rack. 301,670, 6-20-89, Cl. D7-71.000.
Kimberly-Clark Corporation: *See*—
Barrs, Amy W.; Brown, Kurtis L.; Dickson, James F.; and Engleberg, Stephen M., 301,667, Cl. D6-518.000.
Knauer, Allen R. Storage battery cart. 301,792, 6-20-89, Cl. D34-26.000.
Kokkinos, Nick. Combined hammer and hatchet. 301,679, 6-20-89, Cl. D8-75.000.
Kramer, David K.: *See*—
Allen, David W.; and Kramer, David K., 301,731, Cl. D23-213.000.
Lam, Michael C. B. Pair of linked candles. 301,747, 6-20-89, Cl. D26-7.000.
Lam, Michael C. B. Pair of linked candles. 301,748, 6-20-89, Cl. D26-7.000.
Le, Tuan, to Reebok International Ltd. Shoe outsole. 301,659, 6-20-89, Cl. D2-320.000.
Leviton Manufacturing Company, Inc.: *See*—
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Lewis, Bradley W.: *See*—
Turner, Alexander; Lewis, Bradley W.; De Oliveira, Egidio L.; and Scoville, John R., 301,739, Cl. D24-26.000.
Linden, Erkki O., to Fiskars Oy Ab. Scissors. 301,678, 6-20-89, Cl. D8-57.000.
Long, Randy L. Bracket for clock, figure toy or similar article. 301,686, 6-20-89, Cl. D8-373.000.
Malagrida, Joanna. Fluid distribution manifold. 301,732, 6-20-89, Cl. D23-263.000.
Malamoud, Jean G., to S. T. Dupont. Lighter thumbroller. 301,761, 6-20-89, Cl. D27-161.000.
Mansfield, Bentley. Microwave-powered water heater. 301,733, 6-20-89, Cl. D23-318.000.
Markovits, Jacob. Rope chain. 301,698, 6-20-89, Cl. D11-13.000.
Markovits, Jacob. Rose chain. 301,699, 6-20-89, Cl. D11-13.000.
McCready, Karen E., to Elleance Ltd. Lipstick case. 301,772, 6-20-89, Cl. D28-85.000.
McKeever, Michael D. Combined terrarium and aquarium. 301,775, 6-20-89, Cl. D30-104.000.
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Turner, Alexander; Lewis, Bradley W.; De Oliveira, Egidio L.; and Scoville, John R., 301,739, Cl. D24-26.000.
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Meyers, Wayne E., to Raphael Investments. Cabinet for a fireplace simulation burner unit. 301,735, 6-20-89, Cl. D23-345.000.
MinnFac, Inc.: *See*—
Hanson, Mark L., 301,756, Cl. D26-68.000.
Hanson, Mark L., 301,757, Cl. D26-68.000.
Mobberley, Laura P., to Sealright Co., Inc. Container lid. 301,690, 6-20-89, Cl. D9-452.000.
Mobberley, Laura P., to Sealright Co., Inc. Container lid. 301,691, 6-20-89, Cl. D9-453.000.
Morizio, Thomas E.: *See*—
Wyzgala, Mark; and Morizio, Thomas E., 301,742, Cl. D24-52.000.
Morris, Donnie. Weighted fishing worm. 301,730, 6-20-89, Cl. D22-127.000.
Morris, Gary F. Adjustable holder for water skiing safety flag. 301,697, 6-20-89, Cl. D10-121.000.
Moscovitch, Jerry N.: *See*—
Ward, Douglas K.; and Moscovitch, Jerry N., 301,710, Cl. D12-185.000.
Murakami, Yukio; and Hara, Noboru, to Fumakilla Limited. Atomizer. 301,773, 6-20-89, Cl. D28-91.100.
Myshyniuk, Larry O. Portable display sign. 301,721, 6-20-89, Cl. D20-10.000.
Nardello, Anthony J., to Nardello, Anthony J.; and Rabbittino, Thomas D. Game board. 301,723, 6-20-89, Cl. D21-27.000.
North American Philips Corporation: *See*—
Adams, Duane D., 301,783, Cl. D32-18.000.
Ochs, Vernon. Combined bird bath and planter. 301,776, 6-20-89, Cl. D30-123.000.
Ogden, Ralph. Height adjustment handle for suspending a grid on a barbeque grill. 301,673, 6-20-89, Cl. D7-402.000.
Ohzu, Itsumi, to Casio Computer Co., Ltd. Portable radio receiver. 301,716, 6-20-89, Cl. D14-188.000.
Orihara, Tazuo: *See*—
Ezaki, Akira; Orihara, Tazuo; and Yamaguchi, Kiminori, 301,780, Cl. D32-5.000.
Osborne, Bryce D. Mechanic's creeper. 301,791, 6-20-89, Cl. D34-23.000.
Oshlack, Benjamin, to Euroceltique S.A. Tablet. 301,762, 6-20-89, Cl. D28-2.000.
Osterhout, Ralph F., to Tekna. Spotlight. 301,752, 6-20-89, Cl. D26-45.000.
P.H. Tech Inc.: *See*—
Dallaire, Raymond; and Dallaire, Dominique, 301,746, Cl. D25-122.000.
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Pemberton, Martin: *See*—
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Percoco, Joseph V.; and Percoco, Richard. Bookend. 301,720, 6-20-89, Cl. D19-34.100.
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Percoco, Joseph V.; and Percoco, Richard, 301,720, Cl. D19-34.100.
Pernosky, Richard J. Strap for securing a seismic water heater. 301,734, 6-20-89, Cl. D23-322.000.
Peterson, Donald G. Belt buckle. 301,702, 6-20-89, Cl. D11-230.000.
Petralia, Salvatore; and Young, H. Gerald, to Regina Company, Inc., The. Vacuum cleaner. 301,784, 6-20-89, Cl. D32-22.000.
Pittway Corporation: *See*—
Fenne, Kenneth R., 301,750, Cl. D26-26.000.
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Ward, Douglas K.; and Moscovitch, Jerry N., 301,710, Cl. D12-185.000.
Powers, John H., to BioClinical Systems, Inc. Microbiological culture. 301,737, 6-20-89, Cl. D24-8.000.
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Rally Manufacturing, Inc.: *See*—
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Raphael Investments: *See*—
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Reebok International Ltd.: *See*—
Brown, Paul D., 301,657, Cl. D2-314.000.
Diaz, Juan A., 301,656, Cl. D2-314.000.
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Regina Company, Inc., The: *See*—
Petralia, Salvatore; and Young, H. Gerald, 301,784, Cl. D32-22.000.
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Ropp, William H., to Huffy Corporation. Cycle pedal. 301,705, 6-20-89, Cl. D12-125.000.
Rorer Pharmaceutical Corporation: *See*—
Contractor, Avinash M.; Auslander, David E.; and Grimm, Wayne M., 301,764, Cl. D28-2.000.
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., 301,765, Cl. D28-2.000.
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., 301,766, Cl. D28-2.000.
Rhoa, Gregory A.; and Shah, Pravinchandra B., 301,763, Cl. D28-2.000.
Rosenblad, Lars-Goran, to Isaberg AB. Stapler. 301,677, 6-20-89, Cl. D8-50.000.
Royston Corporation: *See*—
Suttles, J. Marshall, 301,665, Cl. D6-463.000.
Rudolph, Kevin A.; and Zavala, Donald C., to Hans Rudolph, Inc. Respiratory mask. 301,774, 6-20-89, Cl. D29-7.000.
S. T. Dupont: *See*—
Malamoud, Jean G., 301,761, Cl. D27-161.000.
Sachs, Isaac. Cable identification sleeve. 301,722, 6-20-89, Cl. D20-22.000.
Sapper, Richard F., to Artemide S.P.A. Ceiling lamp. 301,758, 6-20-89, Cl. D26-85.000.
Schechter, Alvin H.; and Thompson, Carl R., to Coca-Cola Company, The. Beverage dispenser valve. 301,672, 6-20-89, Cl. D7-398.000.
Scherpenberg, Francis A.: *See*—
Bolan, Michael L.; Scherpenberg, Francis A.; and Davies, William F., Jr., 301,713, Cl. D14-114.000.
Schremmer, Paul M., to Byrne & Davidson Doors (N.S.W.) Pty. Limited. Drive unit for rolling door. 301,743, 6-20-89, Cl. D25-49.000.
Schremmer, Paul M., to Bryne & Davidson Doors (N.S.W.) Pty. Limited. Combined cover unit and lamp housing for a rolling door. 301,744, 6-20-89, Cl. D25-49.000.
Schwab, Frederick J.: *See*—
Giles, Brian A.; and Schwab, Frederick J., 301,779, Cl. D32-1.000.
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Fides Beheer: *See*—
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Kitahara, Gary R.: *See*—
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ISSUED JUNE 20, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 75	
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3.43	4,840,093
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297 R	4,840,103
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CLASS 110	
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439	4,840,685
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368.1	4,840,217
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198	4,840,706
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70 S	4,841,103
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10.55 E 4,841,112
60 A 4,841,115
69.2 4,841,126
73.1 4,841,116
76.1 4,841,117
110 4,841,113
121.47 4,841,114
124.03 4,841,118
125.12 4,841,123
146.1 4,841,119
201 4,841,124
216 4,841,120
225 4,841,127
273 4,841,122
506 4,841,125

CLASS 220

1.5 4,840,282
5 A 4,840,283
4,840,284
47 4,840,285
306 4,840,286
316 4,840,287
334 4,840,288
359 4,840,289

CLASS 221

10 4,840,290
59 4,840,291

CLASS 222

1 4,840,292
94 4,840,293
287 4,840,294
598 4,840,295
600 4,840,296
607 4,840,297

CLASS 224

39 4,840,298
274 4,840,332

CLASS 225

52 4,840,299

CLASS 226

187 4,840,300

CLASS 227

139 4,840,301

CLASS 228

123 4,840,302
164 4,840,303
214 4,840,304
232 4,840,305

CLASS 229

73 4,840,306

CLASS 232

35 4,840,307

CLASS 235

96 4,841,130
380 4,841,131
472 4,841,129
4,841,132
488 4,841,134
491 4,841,128
492 4,841,133

CLASS 236

13 4,840,308

CLASS 238

14 4,840,309

CLASS 239

74 4,840,311
205 4,840,312
456 4,840,313
533.4 4,840,310

CLASS 241

24 4,840,314
4,840,315
279 4,840,316
282 4,840,317
294 4,840,318

CLASS 242

55.53 4,840,319
58 4,840,320
58.6 4,840,321
67.1 R 4,840,322
72 B 4,840,323
107.2 4,840,325
107.6 4,840,324
199 4,840,326
217 4,840,327

CLASS 244

3.15 4,840,328
12.5 4,840,329
17.27 4,840,330
212 4,840,331

CLASS 248

68.1 4,840,333
73 4,840,334
74.2 4,840,345
97 4,840,335
4,840,336
115 4,840,337
168 4,840,338
205.2 4,840,339
240.4 4,840,340
316.5 4,840,341
475.1 4,840,342
500 4,840,343
676 4,840,344

CLASS 249

243 4,841,121

CLASS 250

209 4,841,138
221 4,841,141
223 R 4,841,139
226 4,841,140
227 4,841,142
231 R 4,841,136
236 4,841,137
239 4,841,144
288 4,841,143
304 4,841,145
306 4,841,148
317.1 4,841,154
324 4,841,146
327.2 4,841,147
330 4,841,149
339 4,841,150
364 4,841,151
374 4,841,152
390.04 4,841,153
461.1 4,841,156
463.1 4,841,155
574 4,841,157

CLASS 251

1.3 4,840,346
63.4 4,840,347
63.6 4,840,348
129.11 4,840,349
4,840,350
230 4,840,351

CLASS 252

8.6 4,840,738
17 4,840,739
32.7 E 4,840,740
47 4,840,741
49.5 4,840,742
49.6 4,840,743
51.5 A 4,840,744
73 4,840,745
174.25 4,840,746
301.4 R 4,840,747
344 4,840,748

CLASS 254

134.4 4,840,352

CLASS 260

378 4,840,749
544 A 4,840,750

CLASS 261

36.1 4,840,751
72.1 4,840,752
76 4,840,753

CLASS 264

2.2 4,840,754
15 4,840,755
22 4,840,756
4,840,757
26 4,840,758
29.2 4,840,762
53 4,840,759
65 4,840,763
102 4,840,764
245 4,840,760
254 4,840,761

CLASS 266

80 4,840,353
218 4,840,354
220 4,840,355
265 4,840,356

CLASS 267

140.1 4,840,357
4,840,358
4,840,359

CLASS 269

48.1 4,840,360
289 R 4,840,361
328 4,840,362
4,840,363

CLASS 270

38 4,840,364
54 4,840,365

CLASS 271

9 4,840,366
160 4,840,367
162 4,840,368
276 4,840,369

CLASS 272

8 N 4,840,371
68 4,840,370
72 4,840,372
134 4,840,373

CLASS 273

1 G 4,840,374
14 4,840,376
31 4,840,377
60 B 4,840,378
77 A 4,840,380
121 A 4,840,375
232 4,840,381
237 4,840,382
420 4,840,383

CLASS 277

12 4,840,384
53 4,840,385
212 FB 4,840,386
222 4,840,379

CLASS 279

1 K 4,840,387

CLASS 280

33.994 4,840,388
91 4,840,389
250.1 4,840,390
304.1 4,840,391
477 4,840,392
661 4,840,393
677 4,840,394
688 4,840,395
690 4,840,396
739 4,840,397
756 4,840,398
757 4,840,399
770 4,840,400
804 4,840,401
4,840,402
808 4,840,403
4,840,404
4,840,405

CLASS 281

1 4,840,406
48 4,840,407

CLASS 285

62 4,840,408
167 4,840,409
261 4,840,410

CLASS 292

251.5 4,840,411
337 4,840,412
4,840,413
356 4,840,414

CLASS 294

1.1 4,840,415
2 4,840,416
65.5 4,840,417

CLASS 296

91 4,840,418
108 4,840,419
116 4,840,420
122 4,840,421
180.4 4,840,422
194 4,840,423
204 4,840,424

CLASS 297

284 4,840,425
300 4,840,426
346 4,840,427
408 4,840,428
409 4,840,429
452 4,840,430

CLASS 299

39 4,840,431
64 4,840,432

CLASS 303

9.68 4,840,433
113 4,840,434
116 4,840,435
119 4,840,436

CLASS 305

10 4,840,437
36 4,840,438

CLASS 307

10.1 4,841,158
38 4,841,159
66 4,841,160
85 4,841,161
112 4,841,162
116 4,841,163
117 4,841,164
132 R 4,841,165
246 4,841,166
269 4,841,167
272.2 4,841,168
303 4,841,169
310 4,841,170
355 4,841,171
443 4,841,172
456 4,841,173
469 4,841,174
475 4,841,175
4,841,176
494 4,841,177
518 4,841,178
520 4,841,179
530 4,841,180

CLASS 310

12 4,841,181
68 D 4,841,182
90 4,841,183
90.5 4,841,184
115 4,841,185
156 4,841,186
171 4,841,187
200 4,841,188
257 4,841,189
4,841,190
317 4,841,191
337 4,841,192

CLASS 312

116 4,840,439
140 4,840,440
231 4,840,441

CLASS 313

318 4,841,193
496 4,841,194
636 4,841,195

CLASS 315

65 4,841,196
82 4,841,198
83 4,841,199
111.81 4,841,197
363 4,841,200
411 4,841,201

CLASS 318

14 4,841,202
53 4,841,203
254 4,841,204
282 4,841,205
561 4,841,208
564 4,841,209
568.24 4,841,210
569 4,841,211
607 4,841,212
661 4,841,213
696 4,841,214
757 4,841,215

CLASS 322

8 4,841,217
10 4,841,216
24 4,841,218

CLASS 323

274 4,841,219
282 4,841,220
311 4,841,222
320 4,841,221

CLASS 324

58.5 A 4,841,223
61 P 4,841,224
61 R 4,841,225
4,841,226
4,841,227
62 4,841,228
63 4,841,229
65 R 4,841,230
73 R 4,841,231
4,841,232
4,841,233
96 4,841,234
117 R 4,841,235
127 4,841,236
4,841,237
144 4,841,238
158 F 4,841,241
158 P 4,841,240
158 R 4,841,239
4,841,242
174 4,841,243
204 4,841,244
208 4,841,245
4,841,246
309 4,841,247
318 4,841,248
4,841,249
349 4,841,250

CLASS 328

36 4,841,251

CLASS 330

9 4,841,252
253 4,841,254
277 4,841,253

CLASS 331

14 4,841,255
25 4,841,256
26 4,841,257

CLASS 332

9 R 4,841,258

CLASS 333

17.2 4,841,259
21 A 4,841,260
4,841,261
81 R 4,841,262
173 4,841,263
189 4,841,264
194 4,841,265

CLASS 335

16 4,841,266
210 4,841,267
216 4,841,268
299 4,841,269

CLASS 336

61 4,841,270

CLASS 337

248 4,841,356
320 4,841,271

CLASS 338

2 4,841,272
28 4,841,273
4,841,274
195 4,841,275

CLASS 340

146.2 4,841,279
310 A 4,841,281
426 4,841,277
466 4,841,276
521 4,841,282
545 4,841,283
567 4,841,284
571 4,841,285
653 4,841,286
690 4,841,287
4,841,288
703 4,841,289
706 4,841,280
707 4,841,290
725 4,841,291
736 4,841,292
763 4,841,293
793 4,841,294
825.5 4,841,295
870.16 4,841,296
908.1 4,841,278

CLASS 341

11 4,841,297
51 4,841,298
65 4,841,299
94 4,841,300
126 4,841,301

CLASS 342

20 4,841,302
359 4,841,303
460 4,841,304

CLASS 343

766 4,841,309
771 4,841,308
912 4,841,305

CLASS 346

1.1 4,841,306
4,841,307
75 4,841,310
108 4,841,311
159 4,841,313
160 4,841,314
160 R 4,841,312

CLASS 350

1.6 4,840,442
3.71 4,840,443
3.85 4,840,444

6.8 4,840,445
4,841,135
96.13 4,840,446
96.14 4,840,447
96.16 4,840,448
96.20 4,840,449
4,840,450
4,840,451
96.23 4,839,970
4,840,452
4,840,453
4,840,454
137 4,840,455
162.17 4,840,456
255 4,840,457
319 4,840,458
333 4,840,459
4,840,460
346 4,840,461
350 S 4,840,462
4,840,463
355 4,840,464
421 4,840,465
422 4,840,466
427 4,840,467
4,840,468
4,840,469
429 4,840,470
438 4,840,471
442 4,840,472
484 4,840,473
572 4,840,474
604 4,840,475

CLASS 351

63 4,840,476
162 4,840,477
177 4,840,478
235 4,840,479

CLASS 353

280 4,841,375

CLASS 354

1 4,841,315
4 4,841,316
65 4,841,317
173.1 4,841,318
275 4,841,319
299 4,841,320
324 4,841,321
400 4,841,322
4,841,323
402 4,841,324
4,841,325
403 Re.32,959
406 4,841,326
412 4,841,327

CLASS 355

27 4,841,338
4,841,339
38 4,841,340
43 4,841,341
71 4,841,342
77 4,841,343
157 4,841,337
211 4,841,328
4,841,333
245 4,841,329
4,841,330
4,841,331
4,841,335
4,841,336
251 4,841,332
271 4,841,334

CLASS 356

32 4,840,480
4,840,481
73.1 4,840,482
153 4,840,483
312 4,840,484
317 4,840,485
338 4,840,486
350 4,840,489
355 4,840,487
374 4,840,488
375 4,840,490

CLASS 357

17 4,841,344
23.1 4,841,346
23.4 4,841,345
23.9 4,841,347
30 4,841,348
4,841,349
4,841,350
4,841,351
45 4,841,352
51 4,841,353
71 4,841,354
82 4,841,355

CLASS 358

17 4,841,357
75 4,841,358
76 4,841,359
80 4,841,360
4,841,361
4,841,362
98 4,841,363
101 4,841,364
147 4,841,365
167 4,841,366
181 4,841,367
194.1 4,841,368
213.26 4,841,369
227 4,841,370
244 4,841,371
247 4,841,372
257 4,841,373
280 4,841,374
282 4,841,376
283 4,841,377
335 4,841,378
337 4,841,379

CLASS 360

10.2 4,841,380
10.3 4,841,381
32 4,841,382
33.1 4,841,383
60 4,841,384
65 4,841,385
69 4,841,386
72.1 4,841,387
75 4,841,389
77.14 4,841,390
85 4,841,391
4,841,392
98.07 4,841,393
99.06 4,841,394
103 4,841,395
104 4,841,396
105 4,841,397
113 4,841,398
4,841,399
125 4,841,400
4,841,401
126 4,841,402
132 4,841,403
721 4,841,388

CLASS 361

30 4,841,404
45 4,841,508
80 4,841,405
91 4,841,406
146 4,841,407
220 4,841,408
230 4,841,409
306 4,841,410
323 4,841,411
393 4,841,412
400 4,841,413
424 4,841,414

CLASS 362

90 4,841,415
183 4,841,416
206 4,841,417
223 4,841,418
226 4,841,419
249 4,841,420
279 4,841,421
294 4,841,422
304 4,841,423
352 4,841,424

CLASS 363

21 4,841,425
37 4,841,426
62 4,841,427
75 4,841,428
126 4,841,429

CLASS 364

167.01 4,841,430
187 4,841,431
191 4,841,432
200 4,841,433
4,841,434
4,841,435
4,841,436
4,841,437
4,841,438
4,841,439
4,841,440
401 4,841,441
405 4,841,442
413.01 4,841,443
421 4,841,444
424.1 4,841,445
426.02 4,841,446
431.07 4,841,447
433 4,841,448
449 4,841,449
468 4,841,450
484 4,841,451
519 4,841,453
521 4,841,454
525 4,841,455
550 4,841,456
557 Re.32,960
4,841,457
4,841,458
4,841,459
571.02 4,841,460
572 4,841,461
723 4,841,462
724.16 4,841,463
725 4,841,464
4,841,465
733 4,841,466
748 4,841,467
754 4,841,468
4,841,469
821 4,841,470
825 4,841,471
900 4,841,472
4,841,473
4,841,474
4,841,475
4,841,476
4,841,477
4,841,478
4,841,479

CLASS 365

87 4,841,480
154 4,841,481
185 4,841,482
189.07 4,841,483
190 4,841,484
201 4,841,485
207 4,841,486
230.01 4,841,487
233 4,841,488

CLASS 366

69 4,840,491
81 4,840,492
339 4,840,493

CLASS 367

4,841,489
38 4,841,490
103 4,841,491
105 4,841,492
140 4,841,493
157 4,841,494
191 4,841,495

CLASS 368

107 4,841,496
113 4,841,497
120 4,841,500

CLASS 369

13 4,841,501
4,841,502
14 4,841,503
32 4,841,498
4,841,504
4,841,505
4,841,506
38 4,841,499
44 4,841,507
46 4,841,509
4,841,510
50 4,841,511
54 4,841,512
59 4,841,513
100 4,841,514
4,841,515
264 4,841,516
270 4,841,517
4,841,518

CLASS 370

3 4,841,519
13 4,841,520
31 4,841,521
64 4,841,522
89 4,841,523
112 4,841,524

CLASS 371

21 4,841,525
32 4,841,526
4,841,527

CLASS 372

22 4,841,528
32 4,841,529
41 4,841,530
43 4,841,531
45 4,841,532
4,841,533
46 4,841,534
4,841,535
4,841,536
55 4,841,537
58 4,841,538
63 4,841,539
86 4,841,540
94 4,841,541

CLASS 373

73 4,841,542

CLASS 374

1 4,840,494
43 4,840,495
44 4,841,543
124 4,840,496

CLASS 375

1 4,841,544
4,841,545
53 4,841,547
110 4,841,548
111 4,841,549
118 4,841,550
4,841,551

CLASS 376

310 4,840,765
378 4,840,766

CLASS 377

43 4,841,552

CLASS 378

4 Re.32,961
19 4,841,553
57 4,841,554
99 4,841,555
119 4,841,556
141 4,841,557
182 4,841,558

CLASS 379

27 4,841,559
29 4,841,560
97 4,841,561
104 4,841,562
150 4,841,563
352 4,841,566
355 4,841,567
380 4,841,568
413 4,841,564
4,841,565

CLASS 380

7 4,841,569
30 4,841,570
31 4,841,571

CLASS 381

17 4,841,572
27 4,841,573
31 4,841,574
36 4,841,575

CLASS 383

4 4,840,497

CLASS 384

213 4,840,498

CLASS 388

811 4,841,207
828 4,841,206

CLASS 400

83 4,840,499
120 4,840,500
124 4,840,501
196 4,840,502
208 4,840,503
213 4,840,504
621 4,840,506
697.1 4,840,505
713 4,840,507

CLASS 401

65 4,840,508
149 4,840,510
198 4,840,509
213 4,840,511

CLASS 403

22 4,840,512
49 4,840,513

CLASS 404

25 4,840,514

CLASS 405

33 4,840,516
45 4,840,515
241 4,840,517

CLASS 407

113 4,840,518

CLASS 408

226 4,840,519

CLASS 409

232 4,840,520

CLASS 411

14 4,840,521
44 4,840,522
48 4,840,523
82 4,840,524
85 4,840,525
263 4,840,526
344 4,840,527
351 4,840,528
397 4,840,529

CLASS 414

404 4,840,530
409 4,840,531
479 4,840,532
495 4,840,533
563 4,840,534

CLASS 415

168.2 4,840,535
190 4,840,536
202 4,840,537

CLASS 416

96 A 4,840,538
191 4,840,539
223 A 4,840,540
223 R 4,840,541

CLASS 417

9 4,840,542
223 4,840,543
254 4,840,544
301 4,840,545
403 4,840,546
422 4,840,547
469 4,840,548

CLASS 418

55 4,840,549
150 4,840,550

CLASS 419

27 4,840,767

CLASS 420

582 4,840,768

CLASS 422

26 4,840,769
49 4,840,770
61 4,840,772
104 4,840,771
124 4,840,773

CLASS 423

79 4,840,774
150 4,840,775
4,840,776
229 4,840,777
324 4,840,778
328 4,840,779
329 4,840,780
345 4,840,781
576.6 4,840,782
648.1 4,840,783

CLASS 424

3 4,840,784
9 4,840,785
43 4,840,786
52 4,840,787
59 4,840,788
66 4,840,789
70 4,840,790
71 4,840,791
76.1 4,840,792
85.8 4,840,793
92 4,840,794
448 4,840,796
475 4,840,797
488 4,840,798
493 4,840,799
690 4,840,795

CLASS 425

12 4,840,551
72.1 4,840,552
129.1 4,840,553
190 4,840,554
500 4,840,555
543 4,840,556
555 4,840,557

CLASS 426

2 4,840,800
3 4,840,801
16 4,840,802
48 4,840,807
94 4,840,803
103 4,840,804
129 4,840,805
270 4,840,806
4,840,808
285 4,840,809
312 4,840,810
430 4,840,811
488 4,840,812
565 4,840,813
580 4,840,814
611 4,840,815

CLASS 427

38 4,840,816
45.1 4,840,817
130 4,840,818
245 4,840,819
305 4,840,820
430.1 4,840,821

CLASS 428

4 4,840,822
35.5 4,840,823
36.91 4,840,826
67 4,840,824
77 4,840,825
116 4,840,827
120 4,840,828
131 4,840,829
141 4,840,830
152 4,840,831
156 4,840,832
207 4,840,833
211 4,840,834
212 4,840,835
213 4,840,836
216 4,840,837
234 4,840,838
240 4,840,839
283 4,840,840
286 4,840,841
323 4,840,842
336 4,840,843
4,840,844
4,840,845
373 4,840,846
4,840,847
413 4,840,848
419 4,840,849
471 4,840,850
523 4,840,851
654 4,840,852
698 4,840,853
4,840,854

CLASS 429

120 4,840,855
192 4,840,856
197 4,840,857
4,840,858
212 4,840,859

CLASS 430

59 4,840,860
4,840,861
75 4,840,862
110 4,840,863
4,840,864
114 4,840,865
138 4,840,866
155 4,840,868
156 4,840,867
191 4,840,869
201 4,840,870
203 4,840,871
273 4,840,872
4,840,873
296 4,840,874
309 4,840,875
328 4,840,876
350 4,840,877
380 4,840,878
406 4,840,879
505 4,840,880
4,840,882
512 4,840,881
553 4,840,883
557 4,840,884
558 4,840,886
559 4,840,885
564 4,840,887
567 4,840,888
597 4,840,889
622 4,840,890

CLASS 431

1 4,840,558

CLASS 432

3 4,840,559
59 4,840,560
106 4,840,561

CLASS 433

23 4,840,562
29 4,840,563
72 4,840,564
74 4,840,565
127 4,840,566

CLASS 434

114 4,840,567

CLASS 435

2 4,840,891
5 4,840,892
6 4,840,893
7 4,840,894
4,840,895
68 4,840,896
69 4,840,897

CLASSIFICATION OF PATENTS

87 4,840,898
4,840,899
91 4,840,901
96 4,840,900
161 4,840,902
165 4,840,903
4,840,904
240.25 4,840,905
240.49 4,840,906
253.3 4,840,907
296 4,840,908

CLASS 436

8 4,840,911
20 4,840,909
30 4,840,910
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04 : 4,839,948	4,840,632	4,840,250	4,840,991	4,841,202	25 : 4,840,225
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4,839,966	4,840,730	4,841,219	4,841,261	4,841,528	4,840,644
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DESIGN PATENTS

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28 : 301,770

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06 : 6,861

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12 : 6,874

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